Breaking the Norm: Population-Scale Normative Modeling of Brain Structure in Depression and Anxiety Supplementary Material

Julius Wiegert[1,2], Sebastián Marty-Lombardi[1,2], Jailan Oweda[1,2], Esra Lenz[1,2], Peter Ahnert[3], Klaus Berger[4], Hermann Brenner[5, 6], Josef Frank[7], Hans J. Grabe[8], Karin Halina Greiser[9], Johanna Klinger-König[8], André Karch[4], Michael Leitzmann[10], Claudia Meinke-Franze[11], Rafael Mikolajczyk[12,13], Frauke Nees[14,15,16], Thoralf Niendorf[17], Oliver Sander[18], Carsten Oliver Schmidt[11], Steffi G. Riedel-Heller[19], Kerstin Ritter[20,21,22], Annette Peters[23,24,25], Tobias Pischon[26,27,28], Stephanie Witt[7,29], Johannes Nitsche[1,2], Joonas Naamanka[1,2,30], Sebastian Volkmer[1,2], Antonia Mai[1,2], Amrou Abas[1,2], Xiuzhi Li[1,2], Andreas Meyer-Lindenberg[2], Tobias Gradinger[1,2], Fabian Streit[1,2,29], Urs Braun[1,2], and Emanuel Schwarz*[1,2,29]

[1]Hector Institute for Artificial Intelligence in Psychiatry, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany
[2]Department of Psychiatry and Psychotherapy, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany
[3]Universität Leipzig, Institute for Medical Informatics, Statistics and Epidemiology
[4]Institute of Epidemiology and Social Medicine, University of Münster, Münster, Germany
[5]German Cancer Research Center (DKFZ), Heidelberg, Germany
[6]Network Aging Research, Heidelberg University, Heidelberg, Germany
[7]Department of Genetic Epidemiology in Psychiatry, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany
[8]Department of Psychiatry and Psychotherapy, University Medicine Greifswald, Greifswald, Germany
[9]Division of Cancer Epidemiology, German Cancer Research Center (DKFZ), Heidelberg, Germany
[10]Department of Epidemiology and Preventive Medicine, University of Regensburg, Regensburg, Germany
[11]Institute for Community Medicine, University Medicine Greifswald, Greifswald, Germany
[12]Institute for Medical Epidemiology, Biometrics, and Informatics, Medical Faculty of the Martin Luther University Halle-Wittenberg, Halle (Saale)

[13]German Center for Mental Health (DZPG), partner site Halle-Jena-Magdeburg, Halle (Saale), Germany
[14]Institute of Medical Psychology and Medical Sociology, University Medical Center Schleswig-Holstein, Kiel University, Kiel, Germany
[15]Department of Child and Adolescent Psychiatry and Psychotherapy, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany
[16]Institute of Medical Psychology, Faculty of Medicine, Ludwig-Maximilians-Universität München, Munich, Germany
[17]Berlin Ultrahigh Field Facility (B.U.F.F.), Max Delbrueck Center for Molecular Medicine in the Helmholtz Association (MDC), Berlin, Germany
[18]Clinic for Rheumatology and Hiller Research Center, University Hospital, Heinrich-Heine-University Düsseldorf, Germany
[19]Institute of Social Medicine, Occupational Health and Public Health (ISAP), Leipzig University, Leipzig, Germany
[20]Department of Machine Learning, Hertie Institute for AI in Brain Health, University of Tübingen, Germany
[21]Department of Psychiatry and Neurosciences, Charité – Universitätsmedizin Berlin (corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health), Berlin, Germany
[22]Tübingen AI Center, Tübingen, Germany
[23]Institute of Epidemiology, Helmholtz Zentrum München - German Research Center for Environmental Health (GmbH), Neuherberg, Germany
[24]Chair of Epidemiology, Institute for Medical Information Processing, Biometry and Epidemiology, Medical Faculty, Ludwig-Maximilians-Universität München, Munich, Germany
[25]German Center for Mental Health (DZPG), partner site Munich, Munich, Germany
[26]Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC), Molecular Epidemiology Research Group, Berlin, Germany
[27]Charité - Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany
[28]Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC), Biobank Technology Platform, Berlin, Germany
[29]German Center for Mental Health (DZPG), Partner Site Mannheim - Heidelberg - Ulm, Germany
[30]SleepWell Research Program, Faculty of Medicine, University of Helsinki, Helsinki, Finland

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*Corresponding author

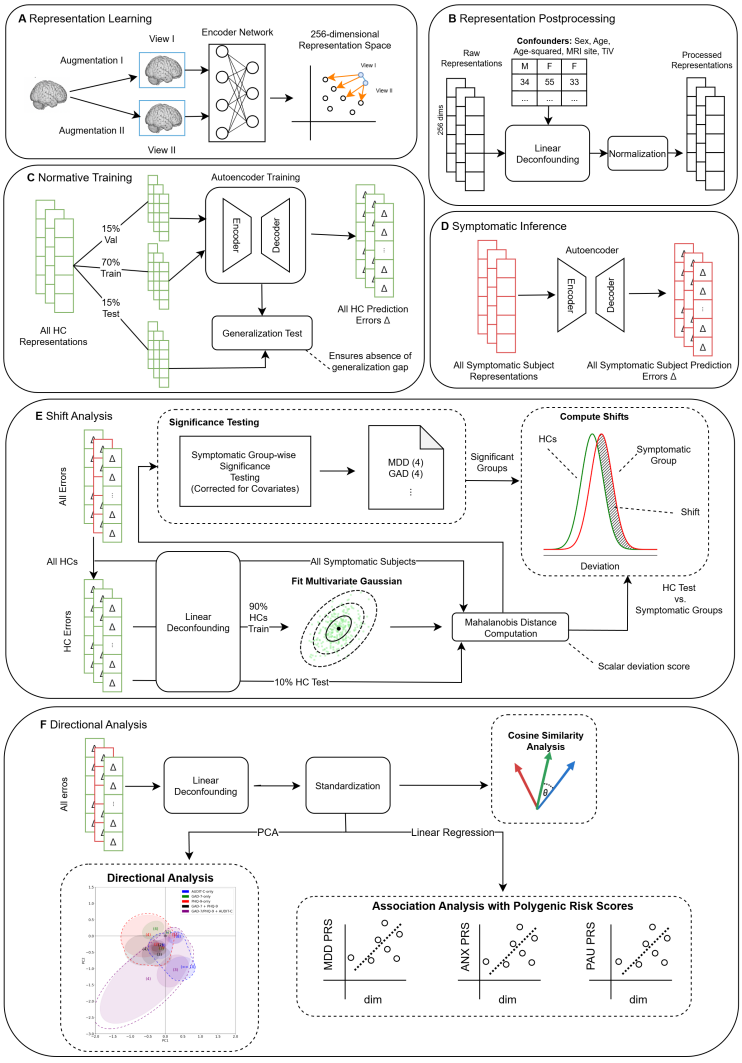


Figure 1: Complete study workflow. (**A**) Representation learning: brain MRI data were augmented and encoded into a 256-dimensional representation space using a contrastive learning framework. (**B**) Representation postprocessing: embeddings were linearly deconfounded for sex, age, age-squared, MRI site, and total intracranial volume (TIV), followed by normalization. (**C**) Normative training: an autoencoder was trained on healthy controls (HCs) with a train–validation–test split to predict HC representations, ensuring no generalization gap. (**D**) Symptomatic inference: deviations (Δ) were obtained for all symptomatic subjects by applying the HC-trained autoencoder. (**E**) Shift analysis: group-level deviations were compared against HC variability using multivariate Gaussian modeling, Mahalanobis distance, and bootstrap significance testing corrected for covariates. (**F**) Directional analysis: deviations were projected via principal component analysis (PCA) and linear regression to characterize directional emergence of cases, including cosine similarity analysis and association with polygenic risk scores (PRS) for major depressive disorder (MDD), anxiety disorders (ANX), and problematic alcohol use (PAU).

1 Data Filtering

1.1 NAKO

Field Name	Description	Missing Value Indicators	Affected
a_emo_miniscr_dp	MINI Screening MDD	7777	226
a_emo_phq9_kat	PHQ-9 category	7777	1 240
a_emo_gad7_dia	GAD-7 category	7777	1 285
a_alk_audit_c	AUDIT-C sum score	-99	1 285
a_alk_rein	Avg. alcohol consumption per day	-99	808

Table 1: Missing values in key phenotypic fields from the NAKO cohort (German National Cohort). Field names correspond to raw database variables: `a_emo_miniscr_dp`, MINI International Neuropsychiatric Interview (MINI) screening for major depressive disorder (MDD); `a_emo_phq9_kat`, Patient Health Questionnaire-9 (PHQ-9) categorical score; `a_emo_gad7_dia`, Generalized Anxiety Disorder-7 (GAD-7) categorical score; `a_alk_audit_c`, Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) sum score; `a_alk_rein`, average alcohol consumption per day. "Missing value indicators" list the coding used for missing data in the raw dataset, and "Affected" gives the number of participants with missing entries.

1.2 UKB

1.2.1 Differing Standard Unit Definitions

In UK Biobank, alcohol units were defined as follows: pint or can of beer/lager/cider = 2 units; single shot of spirits (25 ml) = 1 unit; small glass of fortified wine = 1 unit; standard glass of wine (175 ml) = 2 units; large glass of wine (250 ml) = 3 units; bottle of wine (75 cl) = 9 units.

In NAKO, a standard drink corresponded to one small bottle or glass of beer (0.33 l), one small glass of wine or sparkling wine (0.125 l), or one simple shot of spirits (2 cl).

In general, the alcohol concentration per unit was lower in UKB compared to NAKO, which likely accounts for the higher proportion of participants with AUDIT-C ≥ 10 in UKB relative to NAKO (NAKO: 64% AUDIT 8, 25% AUDIT 9, 11% AUDIT ≥ 10; UKB: 40%, 29%, 30%).

1.2.2 Neurodegenerative Exlcusion

ICD-10 Code	Condition
G30	Alzheimer's Disease
G20	Parkinson's Disease
G10	Huntington's Disease
G12.2	Amyotrophic Lateral Sclerosis (ALS)
G35	Multiple Sclerosis
I60–I64	Stroke
G45.9	Transient Ischemic Attack (TIA)
S06	Traumatic Brain Injury (TBI)
M79.7	Fibromyalgia
G25.0	Essential Tremor
G24	Dystonia
G61.0	Guillain-Barré Syndrome
G36.0	Neuromyelitis Optica
B20	HIV-associated neurocognitive disorders
C71	Brain tumor
G91	Hydrocephalus

Table 2: ICD-10 codes used to exclude participants with neurodegenerative, neurological, or related conditions from the UKB (UK Biobank) instance two MRI cohort. Conditions include major neurodegenerative diseases (e.g., Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis [ALS], multiple sclerosis), cerebrovascular events (stroke, transient ischemic attack [TIA]), traumatic brain injury (TBI), and other neurological disorders listed.

1.2.3 Filtering Summary

Step	Filtering Step	Remaining	Removed	Reason
1	Initial Sample	43 248	–	–
2	FreeSurfer QC	39 369	3 879	Any missing FreeSurfer statistics
3	GAD-7 Filter	29 854	9 515	Any missing GAD-7 question
4	PHQ-9 Filter	25 977	3 877	Any missing PHQ-9 question
5	AUDIT-C Filter	25 977	0	Any missing AUDIT-C question

Table 3: Sequential filtering of the UKB (UK Biobank) MRI instance two cohort. "Remaining" indicates the number of participants retained after each step, and "Removed" gives the number excluded at that stage. FreeSurfer QC = exclusion of participants with missing FreeSurfer-derived brain structural measures; GAD-7 (Generalized Anxiety Disorder-7), PHQ-9 (Patient Health Questionnaire-9), and AUDIT-C (Alcohol Use Disorders Identification Test–Consumption) filters = exclusion of participants with missing responses to any item of the respective questionnaires.

1.2.4 UKB Questionnaire Fields

Field ID Showcase	Description	Missing Value Indicators
p120112	PHQ-9 item	"Prefer not to answer" or *null*
p120111	PHQ-9 item	"Prefer not to answer" or *null*
p120110	PHQ-9 item	"Prefer not to answer" or *null*
p120109	PHQ-9 item	"Prefer not to answer" or *null*
p120108	PHQ-9 item	"Prefer not to answer" or *null*
p120107	PHQ-9 item	"Prefer not to answer" or *null*
p120106	PHQ-9 item	"Prefer not to answer" or *null*
p120105	PHQ-9 item	"Prefer not to answer" or *null*
p120104	PHQ-9 item	"Prefer not to answer" or *null*

Table 4: UK Biobank field IDs corresponding to items of the PHQ-9 (Patient Health Questionnaire-9) depression scale. Each field represents a single questionnaire item. Missing values are coded as either "Prefer not to answer" or left as null entries in the dataset.

Field ID Showcase	Description	Missing Value Indicators
p29058	GAD-7 item	"Prefer not to answer" or *null*
p29059	GAD-7 item	"Prefer not to answer" or *null*
p29060	GAD-7 item	"Prefer not to answer" or *null*
p29061	GAD-7 item	"Prefer not to answer" or *null*
p29062	GAD-7 item	"Prefer not to answer" or *null*
p29063	GAD-7 item	"Prefer not to answer" or *null*
p29064	GAD-7 item	"Prefer not to answer" or *null*

Table 5: UK Biobank field IDs corresponding to items of the GAD-7 (Generalized Anxiety Disorder-7) scale. Each field represents a single questionnaire item. Missing values are coded as either "Prefer not to answer" or left as null entries in the dataset.

Field ID	Description	Missing Value Indicators
p20414	Alcohol consumption frequency	"Prefer not to answer" or *null*
p20403	Number of drinks consumed on a drinking day	"Prefer not to answer" or *null*
p29093	Frequency of consuming six or more units of alcohol	"Prefer not to answer" or *null*

Table 6: UK Biobank field IDs corresponding to items of the AUDIT-C (Alcohol Use Disorders Identification Test–Consumption). Each field represents one questionnaire item. Missing values are coded as either "Prefer not to answer" or left as null entries.

2 Technical Details

2.1 Contrastive Feature Extraction

Normative modeling (NM) requires embedding brain magnetic resonance imaging (MRI) images into a suitable representational space that captures meaningful variations in brain structure. To achieve this, we use momentum contrast (MoCo) [1] for self-supervised feature extraction, reducing the dimensionality of grey matter volume (GMV) images to 256 dimensions. We evaluated three candidate embedding dimensionalities (128, 256, 512) during MoCo pretraining. Although a systematic optimization was not feasible due to the high computational cost of retraining MoCo with different settings—particularly because the augmentation pipeline is CPU-bound, cannot be precomputed, and requires on-the-fly random sampling—256 dimensions consistently yielded the smoothest and most stable loss convergence. In contrast, 128 and 512 dimensions showed slower or less stable convergence under otherwise identical settings. We further note that the optimal embedding size is not independent of other hyperparameters. In particular, the contrastive learning temperature and several architectural choices can interact with dimensionality to influence convergence and representation quality. Consequently, 256 dimensions was selected as a pragmatic choice balancing computational constraints and convergence stability.

MoCo implements contrastive learning by encouraging similar representations for augmented versions of the same image (positive pairs) while pushing apart representations of other images (negative pairs). It maintains a dynamic dictionary of encoded images (size 8 192) via a momentum encoder, ensuring a rich and diverse set of negative pairs, which is crucial for effective contrastive learning. By decoupling the number of negative pairs from batch size, MoCo remains scalable and efficient.

Unlike autoencoders (AEs), which prioritize input reconstruction, MoCo directly optimizes embedding similarity and dissimilarity, producing more structured representations. Additionally, it avoids the need for bottleneck tuning or reconstruction loss adjustments, making it a robust choice for feature extraction. Furthermore, in our experiments, AEs were unable to embed the data into meaningfully compact representations as effectively as MoCo. When constrained to smaller latent spaces, they either suffered from mode collapse or exhibited poor reconstruction quality.

To generate positive pairs, we apply two different random augmentations to the same original image, ensuring that both views retain the core anatomical features while introducing small variations. These augmentations—random affine transformations, random gamma adjustments, Gaussian noise, Gaussian blur, and random elastic deformations—help the model learn invariance to minor differences while still recognizing that both augmented views originate from the same underlying brain scan. We use the TorchIO library [2] to apply these transformations to the fully processed images.

Our MoCo encoder is a lightweight convolutional network implemented in PyTorch [3] consisting of five convolutional blocks, each followed by ReLU activation and max pooling (stride = 2) for downsampling, and three fully connected layers for gradual downsampling. The full architecture is detailed in Table 7.

We train the network using AdamW [4] with a weight decay of 10^{-4}, a learning rate of 0.0005, and a batch size of 40. Training was performed until convergence at 711 epochs on an 8GB GPU, with early stopping applied based on the plateauing of the contrastive loss. A random 10% validation holdout was used, with a patience of 10 epochs. To maximize sample size, we train MoCo on the remaining 90% of the NAKO dataset (symptomatic subjects and HCs) since NM is performed in an independent preprocessing step and the MoCo feature extraction can be considered unsupervised.

Block	Layer Type	Kernel Size	Channels	Stride	Activation
Block 1	Conv3D	$3 \times 3 \times 3$	$1 \rightarrow 32$	1	ReLU
	MaxPool3D	$3 \times 3 \times 3$	-	2	-
Block 2	Conv3D	$3 \times 3 \times 3$	$32 \rightarrow 32$	1	ReLU
	MaxPool3D	$3 \times 3 \times 3$	-	2	-
Block 3	Conv3D	$3 \times 3 \times 3$	$32 \rightarrow 64$	1	ReLU
	MaxPool3D	$3 \times 3 \times 3$	-	2	-
Block 4	Conv3D	$3 \times 3 \times 3$	$64 \rightarrow 64$	1	ReLU
	MaxPool3D	$3 \times 3 \times 3$	-	2	-
Block 5	Conv3D	$3 \times 3 \times 3$	$64 \rightarrow 64$	1	ReLU
Fully Connected	Linear	-	$8000 \rightarrow 512$	-	ReLU
	Linear	-	$512 \rightarrow 256$	-	ReLU
	Linear	-	$256 \rightarrow 256$	-	-

Table 7: Architectural overview of the MoCo (Momentum Contrast) encoder convolutional neural network used for representation learning on 3D brain MRI data. Conv3D = three-dimensional convolutional layer; MaxPool3D = three-dimensional max-pooling layer; Linear = fully connected layer; ReLU = rectified linear unit activation function. Channels indicate input and output feature maps for each layer.

2.2 Deconfounding Strategy

Many of the differences captured by MoCo appear to be influenced by confounding factors (Figure 2), which may obscure the underlying pathological signal. Therefore, we apply linear deconfounding using linear regression residualization with sex (one-hot encoded), age, age-squared, total intracranial volume (TiV), and recruitment center (one-hot encoded) as confounders. TiV was extracted using the TiV estimated by FreeSurfer [5]. We perform this linear deconfounding on each of the 256 MoCo dimensions. As shown in Figure 2, the magnitude of significant Spearman correlations between embeddings and confounders is markedly reduced after deconfounding, indicating effective removal of confounding effects.

We also explored more complex deconfounding strategies, such as conditional AEs and adversarial deconfounding, but found the optimization procedure to be diverging, likely due to the strong and pervasive nature of confounding in the dataset. As a result, we opted for rigorous linear deconfounding, potentially at the cost of some signal loss, with the aim of reducing—though not entirely eliminating—confounding bias in downstream analyses.

2.3 Normative Modeling

We use the deconfounded MoCo embeddings as input for our NM pipeline, performing all modeling exclusively on the HC data. First, we min-max scale the embeddings to ensure stability during subsequent modeling. We then employ a simple 8-hidden-layer AE with ReLU activations to model normality of the deconfounded, scaled MoCo embeddings. Table 8 describes the AE architecture in detail.

The AE is trained to minimize the mean squared error (MSE) reconstruction loss. We use the AdamW optimizer (learning rate 0.0005) with batch size 64 for 300 epochs, compressing the data into a latent representation of size 50, which corresponds to approximately 20% of the original MoCo

Layer	Type	Output Dimension
Input	-	256
Block 1	Linear	150
	ReLU	150
Block 2	Linear	100
	ReLU	100
Block 3	Linear	75
	ReLU	75
Block 4	Linear	50
	ReLU	50
Block 5	Linear	75
	ReLU	75
Block 6	Linear	100
	ReLU	100
Block 7	Linear	150
	ReLU	150
Block 8	Linear	256
	Sigmoid	256

Table 8: Architecture of the normative autoencoder used for reconstruction of deconfounded brain MRI embeddings. The network consists of eight fully connected (linear) blocks with symmetric compression and expansion, mapping the 256-dimensional input to a 50-dimensional bottleneck and back to 256 dimensions. ReLU = rectified linear unit activation function; Sigmoid = logistic activation function.

embedding size. This bottleneck size was chosen to balance expressiveness and compression. This configuration yields no generalization gap between the training data and a 15% random validation as well as test data split. We used the validation data to apply early-stopping with a patience of 20 epochs.

The generalization gap refers to the difference between a model's performance on training data versus unseen data. In NM, we want detected deviations to reflect meaningful pathological differences rather than artifacts of poor generalization. If a model has a large generalization gap, deviations in symptomatic subjects may be indistinguishable from errors due to poor generalization. By demonstrating that our model does not exhibit significantly larger errors on unseen HC (test set) than on seen HC (train and validation set), we increase the likelihood that deviations observed in symptomatic subjects truly reflect clinically meaningful effects. To confirm the absence of such effects, we compared reconstruction error distributions between training, validation, and test subsets of HCs using one-sided Mann–Whitney U tests. We found no significant differences between training and validation ($p = 0.26$) or between training and test ($p = 0.50$) reconstruction error distribution, supporting the stability and generalizability of our model.

Given the absence of a generalization gap, the underlying assumption is that the AE reconstructs embeddings of HCs more accurately than those of symptomatic subjects. To quantify this, we model the distribution of HC reconstruction errors using the Mahalanobis distance [6], which enables the assessment of how atypical a symptomatic subject's reconstruction error is relative to the normative distribution observed in HCs. The Mahalanobis distance is defined as:

$$D_M(x) = \sqrt{(x-\mu)^T \Sigma^{-1} (x-\mu)} \tag{1}$$

where x is the 256-dimensional reconstruction error of a given subject's embedding, μ is the mean loss of HCs, and Σ denotes the covariance matrix of the losses in the HC population. We chose this NM approach for its simplicity, its straightforward interpretability, and the fact that it does not require hyperparameter tuning. Since the Mahalanobis distance accounts for correlations between variables, it provides a robust measure of how atypical a given symptomatic subject's reconstruction loss is compared to the healthy distribution. A higher Mahalanobis distance indicates a stronger deviation from normality, helping to quantify the shift of symptomatic groups away from HC heterogeneity. We generally refer to those computed Mahalanobis distances as *deviation (from the norm)*.

2.4 Shift Analysis

To quantify how diagnostic groups deviate from the natural variability present in HCs, we performed a shift analysis based on the full distribution of deviation scores. This approach moves beyond mean- or median-based comparisons by assessing how the *entire shape* of the deviation distribution in symptomatic groups diverges from that of HCs. What follows is a mathematical description of the steps performed to quantify the *shift*:

1. Mahalanobis Distance Computation For each subject, we computed the deviation from the normative reference distribution derived from HCs in the deconfounded embedding space. These distances reflect how strongly an individual's brain representation deviates from the normative manifold. After this step, we performed the group-wise significance testing described in the manuscript to ensure meaningfulness of the deviations.

2. Kernel Density Estimation For each diagnosis, we extracted the full set of deviations for all symptomatic groups and compared them to the HC distribution using Gaussian kernel density estimation (KDE) with Silverman's rule for bandwidth selection [7]. This procedure yields smooth estimates of the probability density functions for deviations in both HCs and symptomatic subjects.

3. Exponential Weighting of Deviations To prioritize clinically relevant patterns, we applied an exponential weighting function over the deviation axis, defined as:

$$w(x) = \exp\left(\frac{x}{\max(x)}\right),$$

where x denotes the deviation. This weighting emphasizes larger deviations, under the assumption that they are more likely to reflect pathological alterations rather than normative variability, and we want the shift to be higher if it appears in high deviation density regions.

4. Normalized Excess Area We quantified the *weighted excess area*—the region where the symptomatic group density exceeds the HC density—according to:

$$\text{Excess Area} = \int_{x:\, f_{\text{symptomatic}}(x) > f_{\text{HC}}(x)} \left(f_{\text{symptomatic}}(x) - f_{\text{HC}}(x)\right) w(x)\, dx,$$

where $f_{\text{symptomatic}}(x)$ and $f_{\text{HC}}(x)$ are the KDEs of symptomatic and HC deviations, respectively, and $w(x)$ is the exponential weighting function.

The total weighted area under the symptomatic subject curve normalized this value:

$$\text{Normalization} = \int f_{\text{symptomatic}}(x) \cdot w(x)\, dx,$$

and the final metric was computed as:

$$\text{Fraction of Unexplained Abnormality ("shift")} = \frac{\text{Excess Area}}{\text{Normalization}}.$$

This yields the final easy-to-interpret shift, emphasizing large deviations more harshly.

2.5 Normative Model Stability

To evaluate the robustness of the estimated normative reference distribution parameters (mean μ, covariance Σ), we conducted a bootstrap-based stability analysis.

Specifically, we resampled the full set of HC deviations with replacement 1,000 times, computing the mean vector and covariance matrix for each bootstrap sample. To assess variability, we used multiple stability metrics: (i) the average Euclidean distance and cosine similarity between bootstrap means and their overall centroid, and (ii) the average Frobenius norm between bootstrap covariance matrices and the mean covariance matrix. The Frobenius norm is defined as:

$$\|\Sigma\|_F = \sqrt{\sum_{i=1}^{d} \sum_{j=1}^{d} |a_{ij}|^2} \tag{2}$$

where $\Sigma \in \mathbb{R}^{d \times d}$ is the covariance matrix parameter of the Mahalanobis distance. This analysis was performed separately for both the NAKO and UKB cohorts.

In the NAKO cohort, results indicated low variability: the mean Euclidean distance between bootstrapped means was 0.0019, the cosine similarity was 0.9995, and the normalized covariance stability score was 0.0475 (with zero indicating perfect stability). The UKB cohort exhibited even greater stability, with a mean distance of 0.0002, a cosine similarity of 0.99998, and a normalized covariance score of 0.017. Covariance stability was defined as the average Frobenius norm between each bootstrap covariance and the mean covariance, normalized by the Frobenius norm of the mean covariance. This yields a scale-invariant measure of how consistently the covariance structure is preserved across resampled subsets, with lower values reflecting greater stability.

These findings confirm that the normative model Mahalanobis parameters (mean and covariance) are highly stable across bootstrap samples in both cohorts, supporting the reliability of the learned HC deviation distributions.

2.6 Directional Analysis

Algorithm 1

Require:

Patient table with embeddings $X_p \in \mathbb{R}^{n_p \times D}$, confounders $C_p \in \mathbb{R}^{n_p \times q}$, and group indicators $\{g(i)\}_{i=1}^{n_p}$ over label set $\mathcal{G}$

HC table (already joined) with embeddings $X_h \in \mathbb{R}^{n_h \times D}$ and confounders $C_h \in \mathbb{R}^{n_h \times q}$

1: Concatenate $X \leftarrow \begin{bmatrix} X_p \\ X_h \end{bmatrix} \in \mathbb{R}^{N \times D}$, $C \leftarrow \begin{bmatrix} C_p \\ C_h \end{bmatrix} \in \mathbb{R}^{N \times q}$ where $N = n_p + n_h$.

2: **Linear residualization.** For each feature $j = 1, \ldots, D$, solve

$$(\hat{\alpha}_j, \hat{\beta}_j) \in \arg\min_{\alpha,\beta} \left\| X_{\cdot j} - \alpha \mathbf{1} - C\beta \right\|_2^2, \quad R_{\cdot j} \leftarrow X_{\cdot j} - \hat{\alpha}_j \mathbf{1} - C\hat{\beta}_j.$$

Let $R \in \mathbb{R}^{N \times D}$ collect residuals.

3: **Standardize.** For $j = 1, \ldots, D$ let $\mu_j = \frac{1}{N} \sum_{i=1}^{N} R_{ij}$ and $\sigma_j^2 = \frac{1}{N} \sum_{i=1}^{N} (R_{ij} - \mu_j)^2$. Set $\tilde{R}_{ij} = (R_{ij} - \mu_j)/\sigma_j$; denote $\tilde{R} \in \mathbb{R}^{N \times D}$.

4: **PCA to 2D.** Form $\Sigma = \frac{1}{N} \tilde{R}^\top \tilde{R}$ and take top-2 eigenvectors $W \in \mathbb{R}^{D \times 2}$. Project $Z = \tilde{R}W \in \mathbb{R}^{N \times 2}$ and split $Z = [Z_p; Z_h]$.

5: **HC robust center.** Compute $(c_h, \Lambda_h, Q_h) = \textsc{BootstrapEllipse}(Z_h, B)$ (Alg. 2).

6: **Recentering.** Translate $Z \leftarrow Z - \mathbf{1} c_h^\top$; obtain Z_p, Z_h now centered at the HC median.

7: **Group ellipses.** For each label $g \in \mathcal{G}$, define $S_g = \{z_i \in Z_p : \ g(i) = g\}$. If $|S_g| > 0$, compute $(c_g, \Lambda_g, Q_g) = \textsc{BootstrapEllipse}(S_g, B)$.

8: **Ellipse parameters.** Each ellipse is represented by center $c \in \mathbb{R}^2$ and covariance-like shape $\Sigma^\star = Q \Lambda Q^\top$ where $\Lambda = \mathrm{diag}(\lambda_1, \lambda_2)$. The principal axes are Qe_1, Qe_2 with semi-axis lengths $a_k = \sqrt{\lambda_k}$.

Algorithm 2 BootstrapEllipse: robust ellipse from geometric-median bootstraps

Require: Point set $S = \{x_i\}_{i=1}^n \subset \mathbb{R}^2$, bootstrap count B

1: **for** $b = 1$ to B **do**

2: Draw a bootstrap sample $S^{(b)}$ by sampling n points with replacement from S

3: Compute bootstrap geometric median

$$m_b \in \arg\min_{m \in \mathbb{R}^2} \sum_{x \in S^{(b)}} \|x - m\|_2 \quad \text{(e.g. via Weiszfeld's algorithm [8])}$$

4: **end for**

5: Form $M = \{m_b\}_{b=1}^B$ and its geometric median $c \in \arg\min_m \sum_{b=1}^B \|m_b - m\|_2$ (robust center).

6: Compute the covariance of $\{m_b\}$ with a small ridge: $\Sigma = \mathrm{Cov}(M) + \lambda I_2$ (e.g. $\lambda = 10^{-9}$).

7: Eigendecompose $\Sigma = Q\,\mathrm{diag}(\lambda_1, \lambda_2)\,Q^\top$ with $\lambda_1 \geq \lambda_2 \geq 0$.

8: **return** c (center), $\Lambda = \mathrm{diag}(\lambda_1, \lambda_2)$, and Q (principal directions).

2.7 UKB External Validation Setup

In addition to transferring the models, we also transfer the deconfounding parameters for all confounders except the data collection center, as this variable reflects a dataset-specific effect. To address center-specific differences, we retrain the linear deconfounder for the center variable using only UKB data. For consistency in feature scaling, we apply the same min–max normalization used for the deconfounded embeddings. Due to cohort-specific effects, we had to re-estimate the Mahalanobis distance parameters, μ and Σ, from the HCs within the UKB cohort rather than transferring them from NAKO, because the original parameters yielded unrealistically high Mahalanobis distances in the UKB data (median 44.24 vs. 11.93 when using the NAKO parameters).

For estimating the Mahalanobis parameters used in the shift analysis and significance testing, we applied the same procedure as in NAKO. Specifically, we split the HC data into 90% training and 10% testing. The mean vector μ and covariance matrix Σ were estimated on the 90% training set, and the shift analysis and significance testing were conducted on the remaining 10%. As detailed in Section 2.5, the Mahalanobis parameters in the UKB were found to be robust to sampling variability based on extensive bootstrapping, indicating that these parameters are highly stable within each cohort and largely insensitive to the specific subset of healthy controls used for fitting.

Finally, we reuse the PCA parameters fitted on the NAKO dataset for the directional deviation analysis in UKB.

2.8 Genome-Wise Association Analysis Summary Statistics

PRS	**Source**	**GWAS** N
Problematic Alcohol Use (PAU)	Zhou et al., Nature Medicine, 2023 [9]	$>$ 1,000,000
Major Depressive Disorder (MDD)	Adams et al., Cell, 2025 [10]	$>$ 5,000,000
FinnGen Anxiety Release R12	Kurki et al., Nature, 2023 [11]	$>$ 340,000

Table 9: Sources of polygenic risk scores (PRS) used in this study and corresponding genome-wide association study (GWAS) discovery sample sizes.

3 Extended Results

3.1 Deconfounding

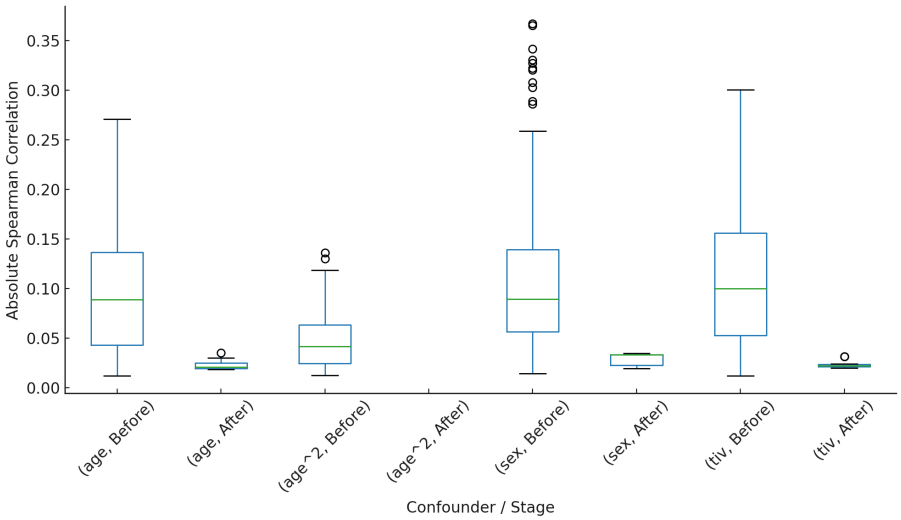


Figure 2: Distributions of absolute Spearman rank correlation coefficients between embedding dimensions and confounders before and after deconfounding. Confounders include age, age-squared, sex, and total intracranial volume (TIV). Only correlations significant at $p_{\mathrm{FDR}} < 0.05$ after Benjamini–Hochberg correction are shown.

3.2 Shift Analysis Extended Results

Figure 3 presents the shift analysis using self-reported doctors' diagnoses and MINI-based diagnoses for NAKO, and ICD-10-based diagnoses for UKB.

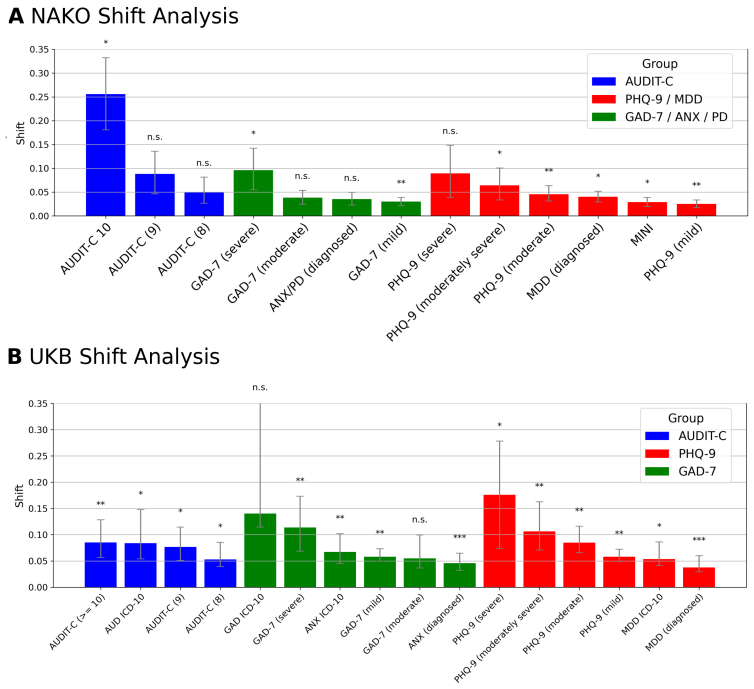


Figure 3: Fraction of group deviations unexplained by healthy control (HC) variability ("shift") for all symptomatic groups in the NAKO cohort (German National Cohort) (**A**) and the UKB cohort (UK Biobank) (**B**). Deviation scores were modeled using linear regression with group membership as the main predictor, adjusting for sex, age, age-squared, and sex–age interactions. Symptomatic groups were defined by AUDIT-C (Alcohol Use Disorders Identification Test–Consumption), PHQ-9 (Patient Health Questionnaire-9) for major depressive disorder (MDD), GAD-7 (Generalized Anxiety Disorder-7), and self-reported physician- or hospital record ICD-10–based diagnoses of anxiety disorders (ANX/PD) or MDD. Asterisks indicate significance levels after Benjamini–Hochberg false discovery rate (FDR) correction: * $p_{\text{FDR}} < 0.05$, ** $p_{\text{FDR}} < 0.01$, *** $p_{\text{FDR}} < 0.005$.

Figure 4 presents the shift analysis in NAKO separated by sex.

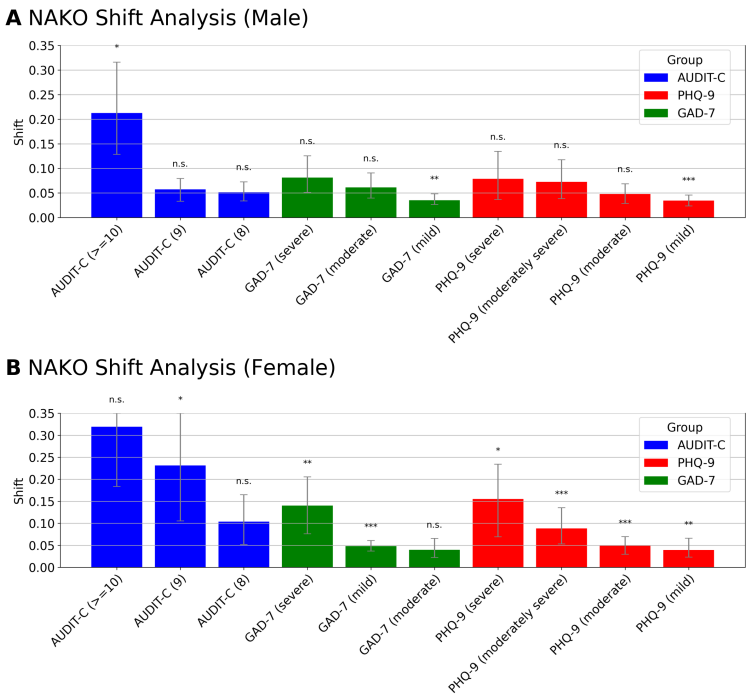


Figure 4: Fraction of group deviations unexplained by healthy control (HC) variability ("shift") in the NAKO cohort (German National Cohort), stratified by sex: (**A**) males and (**B**) females. Deviation scores were modeled using linear regression with group membership as the main predictor, adjusting for age and age-squared. Symptomatic groups were defined by AUDIT-C (Alcohol Use Disorders Identification Test–Consumption), PHQ-9 (Patient Health Questionnaire-9), and GAD-7 (Generalized Anxiety Disorder-7) thresholds. Asterisks indicate significance levels after Benjamini–Hochberg false discovery rate (FDR) correction: * $p_{\mathrm{FDR}} < 0.05$, ** $p_{\mathrm{FDR}} < 0.01$, *** $p_{\mathrm{FDR}} < 0.005$.

Diagnosis	**p-value**	$\mathbf{p_{FDR}}$
MINI	0.0080	0.0174
MDD (diagnosed)	0.0070	0.0174
ANX/PD (diagnosed)	0.2517	0.2975
AUDIT-C (8)	0.7128	0.7128
AUDIT-C (9)	0.0857	0.1237
AUDIT-C (>=10)	0.0045	0.0147
PHQ-9 (mild)	0.0016	0.0088
PHQ-9 (moderate)	0.0008	0.0088
PHQ-9 (moderately severe)	0.0143	0.0265
PHQ-9 (severe)	0.1537	0.1998
GAD-7 (mild)	0.0020	0.0088
GAD-7 (moderate)	0.4490	0.4864
GAD-7 (severe)	0.0258	0.0419

Table 10: ANOVA results for the NAKO cohort (German National Cohort), reporting raw p-values (test of the null hypothesis that group means are equal, PR($> F$)) and Benjamini–Hochberg false discovery rate (FDR)–adjusted p-values (p_{FDR}) for each diagnostic group. MINI = Mini International Neuropsychiatric Interview; MDD = major depressive disorder; ANX/PD = anxiety or panic disorder (doctor's diagnosis); AUDIT-C = Alcohol Use Disorders Identification Test–Consumption; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = Generalized Anxiety Disorder-7.

Tested Group	**p-value**	$\mathbf{p_{FDR}}$
MDD (ICD-10)	0.0153	0.0231
AUD (ICD-10)	0.0396	0.0453
AUDIT-C (8)	0.0391	0.0453
AUDIT-C (9)	0.0173	0.0231
AUDIT-C (>=10)	0.0054	0.0096
ANX (ICD-10)	0.0025	0.0071
GAD (ICD-10)	0.2325	0.2874
PHQ-9 (mild)	0.0031	0.0071
PHQ-9 (moderate)	0.0010	0.0052
PHQ-9 (moderately severe)	0.0025	0.0071
PHQ-9 (severe)	0.0166	0.0231
GAD-7 (mild)	0.0031	0.0071
GAD-7 (moderate)	0.1723	0.1838
GAD-7 (severe)	0.0052	0.0096
MDD (diagnosed)	0.0002	0.0015
ANX (diagnosed)	0.00005	0.0008

Table 11: ANOVA results for the UKB cohort (UK Biobank), reporting raw p-values (test of the null hypothesis that group means are equal, PR($> F$)) and Benjamini–Hochberg false discovery rate (FDR)–adjusted p-values (p_{FDR}) for each tested group. MDD = major depressive disorder; AUD = alcohol use disorder; ANX = anxiety disorder; GAD = generalized anxiety disorder; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = Generalized Anxiety Disorder-7.

3.3 Directional Analysis Extended Results

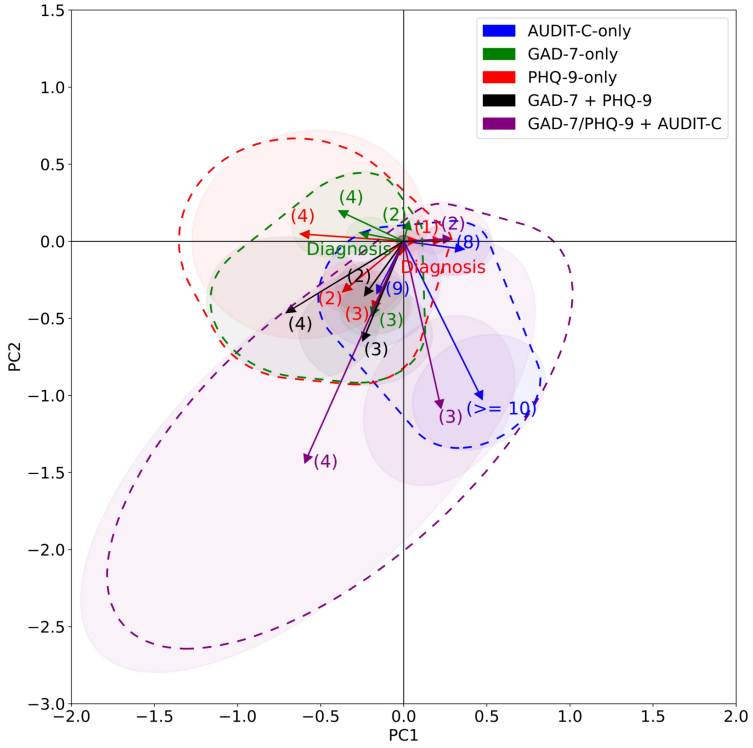
Group	Depression	Anxiety	Alcohol
Depression	0.2836	0.3216	0.2323
Anxiety	-	0.2394	0.1923
Alcohol	-	-	0.3087

Table 12: NAKO cohort (German National Cohort): Mean pairwise cosine similarities between diagnostic groups in the 256-dimensional normative deviation space. Depression groups include all PHQ-9 (Patient Health Questionnaire-9) strata, MINI (Mini International Neuropsychiatric Interview) diagnoses, and self-reported diagnoses. Anxiety groups include all GAD-7 (Generalized Anxiety Disorder-7) strata and self-reported diagnoses. Alcohol groups include all AUDIT-C (Alcohol Use Disorders Identification Test–Consumption) strata. Higher values indicate greater similarity in deviation patterns across diagnostic categories.

Group	Depression	Anxiety	Alcohol
Depression	0.7080	0.6770	0.5351
Anxiety	-	0.8488	0.7875
Alcohol	-	-	0.9653

Table 13: UKB cohort (UK Biobank): Mean pairwise cosine similarities between diagnostic groups in the 256-dimensional normative deviation space. Depression groups include all PHQ-9 (Patient Health Questionnaire-9) strata, ICD-10 (International Classification of Diseases, 10th Revision) diagnoses, and self-reported depression. Anxiety groups include all GAD-7 (Generalized Anxiety Disorder-7) strata, ICD-10 diagnoses, and self-reported anxiety disorders. Alcohol groups include all AUDIT-C (Alcohol Use Disorders Identification Test–Consumption) strata and ICD-10 alcohol use disorder. Higher values indicate greater similarity in deviation patterns across diagnostic categories.

A NAKO Directional Analysis



B UKB Directional Analysis

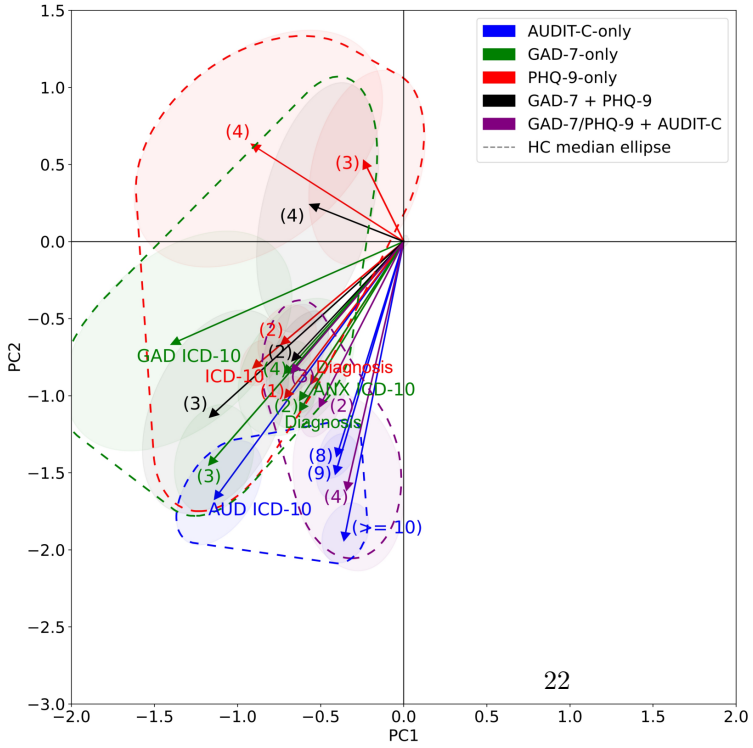


Figure 5: Directional analyses of normative deviation vectors based on principal component analysis (PCA; two dimensions, 21% explained variance) for diagnostic groups in the NAKO (German National Cohort) (**A**) and UKB (UK Biobank) cohort (**B**). Shaded ellipses show the ±1 SD contour of the bootstrap (1,000 resamples) distribution around the group-level geometric median vectors. The dark ellipse at the origin represents the median deviation among healthy controls (HCs), serving as a reference for normative variability. Numbers indicate severity levels: PHQ-9 (Patient Health Questionnaire-9) levels (1–4) = mild, moderate, moderately severe, severe; GAD-7 (Generalized Anxiety Disorder-7) levels (2–4) = mild, moderate, severe; AUDIT-C (Alcohol Use Disorders Identification Test–Consumption) = symptom count. "MDD/GAD + ALC" denotes individuals with acute major depressive disorder (MDD) or generalized anxiety disorder (GAD) symptoms and elevated alcohol use (AUDIT-C $\geq$ 10). "ICD-10" refers to International Classification of Diseases, 10th Revision, hospital record codes, and "Diagnosis" to self-reported conditions. Red ellipses = PHQ/GAD groups, blue = AUDIT-C groups, purple = comorbid groups.

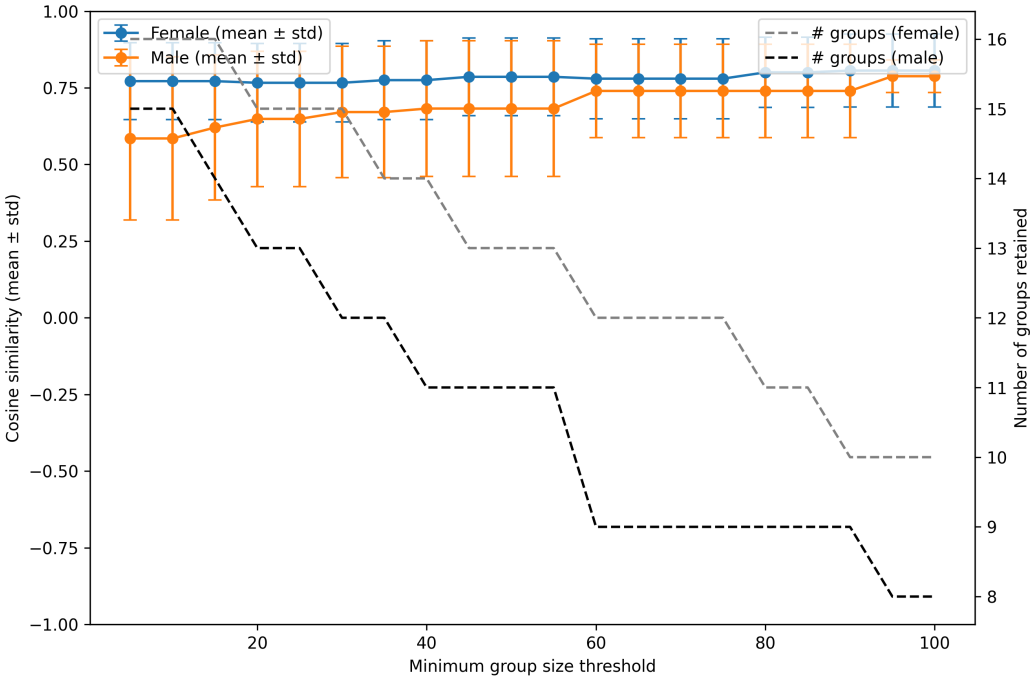


Figure 6: Cosine similarity analysis results for directional analysis with sex stratification. Error bars denote standard deviations across groups; similarity is computed to the joint-sex median vector. The x-axis indicates the minimum group size required for inclusion in the analysis. Dashed lines show the number of groups meeting this threshold.

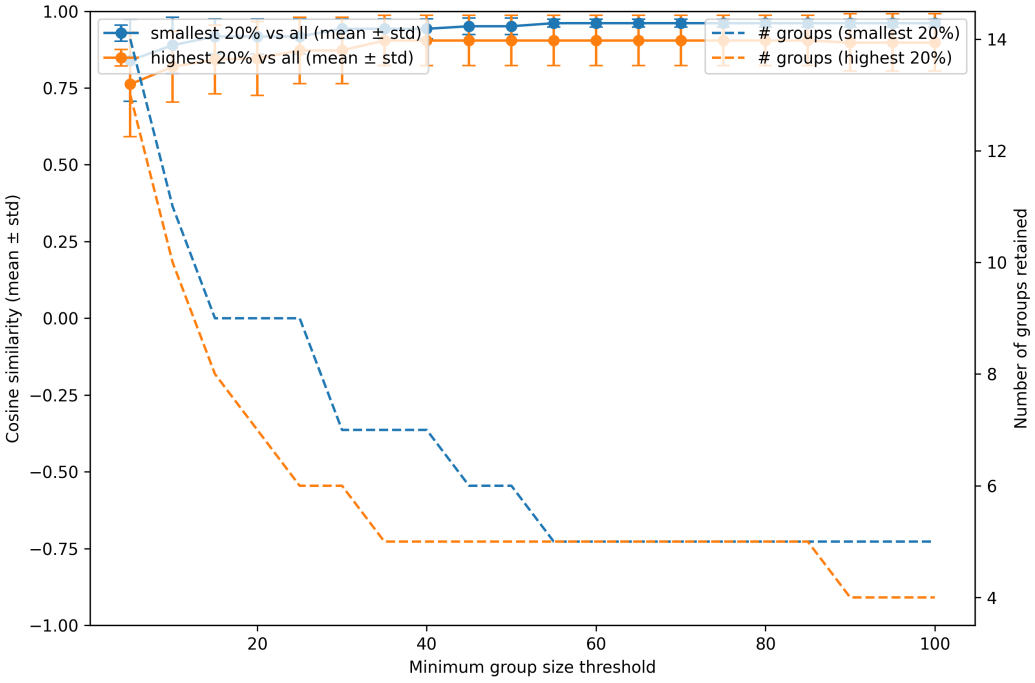


Figure 7: Influence of the interval between MRI and questionnaire acquisition. Error bars denote the standard deviation across groups. Cosine similarity (y-axis) reflects the similarity of each group's median vector (bottom 20% and top 20% of the interval distribution) to the unfiltered median vector. The x-axis indicates the minimum group size required for inclusion in the analysis. Dashed lines show the number of groups meeting this threshold.

3.4 Genetic Associations

3.4.1 Interactions

Table 14: Associations between polygenic risk scores (PRS) and brain normative deviations across embedding dimensions. "Dim" indicates the latent embedding dimension tested, and β_{PRS} is the regression coefficient for the PRS–deviation association. p-values are reported both uncorrected and after Benjamini–Hochberg false discovery rate (FDR) adjustment (p_{FDR}).

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	0	0.012437	0.479194	0.738998
PRS_aud	1	0.057127	0.0724524	0.403878
PRS_aud	2	0.025883	0.144352	0.439929
PRS_aud	3	0.019128	0.25184	0.565536
PRS_aud	4	0.049728	0.00602268	0.307044
PRS_aud	5	−0.040681	0.0166279	0.328878
PRS_aud	6	0.028251	0.217465	0.530199
PRS_aud	7	0.010896	0.620364	0.827151
PRS_aud	8	−0.005296	0.745012	0.896543
PRS_aud	9	−0.001665	0.919146	0.968319
PRS_aud	10	0.017806	0.354422	0.648085
PRS_aud	11	0.041931	0.188584	0.496623
PRS_aud	12	−0.006727	0.714089	0.880641
PRS_aud	13	0.012209	0.477191	0.738998
PRS_aud	14	0.060109	0.0106556	0.307044
PRS_aud	15	0.005359	0.749432	0.896543
PRS_aud	16	−0.025497	0.179796	0.489658
PRS_aud	17	0.027397	0.2779	0.585249
PRS_aud	18	0.011429	0.557691	0.778486
PRS_aud	19	−0.034892	0.165141	0.471946
PRS_aud	20	0.012724	0.441054	0.71462
PRS_aud	21	0.000668	0.967861	0.985352
PRS_aud	22	−0.025205	0.256096	0.566484
PRS_aud	23	0.010417	0.531853	0.778486
PRS_aud	24	−0.043276	0.035971	0.328878
PRS_aud	25	0.017770	0.342965	0.646753
PRS_aud	26	0.009688	0.696572	0.880641
PRS_aud	27	0.033042	0.206832	0.524448
PRS_aud	28	−0.006795	0.68259	0.871727
PRS_aud	29	0.051008	0.00600943	0.307044
PRS_aud	30	−0.010752	0.52682	0.778486
PRS_aud	31	−0.024722	0.178943	0.489658
PRS_aud	32	−0.011810	0.703332	0.880641
PRS_aud	33	−0.004082	0.835848	0.924725

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	34	0.033719	0.0961586	0.411557
PRS_aud	35	−0.004669	0.806458	0.92356
PRS_aud	36	0.026202	0.281194	0.585249
PRS_aud	37	−0.003093	0.877099	0.947415
PRS_aud	38	−0.007102	0.684442	0.871727
PRS_aud	39	0.012843	0.503519	0.758766
PRS_aud	40	−0.021508	0.207644	0.524448
PRS_aud	41	0.035455	0.0864919	0.411557
PRS_aud	42	−0.000911	0.955483	0.982391
PRS_aud	43	0.004855	0.806523	0.92356
PRS_aud	44	−0.047187	0.0354279	0.328878
PRS_aud	45	−0.032457	0.0693933	0.403878
PRS_aud	46	0.008442	0.801791	0.92356
PRS_aud	47	0.025527	0.176037	0.489658
PRS_aud	48	0.012606	0.503868	0.758766
PRS_aud	49	−0.017415	0.479034	0.738998
PRS_aud	50	−0.015839	0.533014	0.778486
PRS_aud	51	−0.020966	0.211008	0.524448
PRS_aud	52	−0.016596	0.322469	0.635016
PRS_aud	53	0.037031	0.046576	0.357726
PRS_aud	54	0.051220	0.0298459	0.328878
PRS_aud	55	0.011996	0.563248	0.778838
PRS_aud	56	−0.024097	0.335151	0.646753
PRS_aud	57	0.003624	0.823378	0.924725
PRS_aud	58	0.007821	0.645	0.84022
PRS_aud	59	0.038771	0.299025	0.607542
PRS_aud	60	0.020465	0.470718	0.738998
PRS_aud	61	0.003762	0.887745	0.954885
PRS_aud	62	−0.047798	0.0524788	0.357726
PRS_aud	63	−0.036025	0.0468923	0.357726
PRS_aud	64	−0.007986	0.67942	0.871727
PRS_aud	65	0.012413	0.495854	0.758766
PRS_aud	66	0.025249	0.140456	0.437546
PRS_aud	67	−0.017624	0.310454	0.619095
PRS_aud	68	0.021887	0.243448	0.552655
PRS_aud	69	−0.035422	0.0344598	0.328878
PRS_aud	70	−0.056594	0.14186	0.437546
PRS_aud	71	−0.012521	0.545997	0.778486
PRS_aud	72	0.064428	0.0540999	0.357726
PRS_aud	73	−0.032796	0.147946	0.445577
PRS_aud	74	0.028749	0.279034	0.585249
PRS_aud	75	0.000014	0.99966	0.99966
PRS_aud	76	0.036245	0.0576676	0.360071

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	77	−0.020673	0.361245	0.655878
PRS_aud	78	−0.018607	0.287371	0.588536
PRS_aud	79	−0.025934	0.151511	0.445827
PRS_aud	80	−0.025250	0.338613	0.646753
PRS_aud	81	−0.002855	0.895155	0.955022
PRS_aud	82	−0.046401	0.0277518	0.328878
PRS_aud	83	0.000823	0.96521	0.985352
PRS_aud	84	0.042815	0.0821909	0.411557
PRS_aud	85	0.006719	0.714016	0.880641
PRS_aud	86	−0.011965	0.545923	0.778486
PRS_aud	87	−0.011326	0.498838	0.758766
PRS_aud	88	0.016438	0.383946	0.664174
PRS_aud	89	0.049705	0.0187417	0.328878
PRS_aud	90	−0.044602	0.185179	0.493811
PRS_aud	91	−0.016443	0.474011	0.738998
PRS_aud	92	−0.038558	0.0741494	0.403878
PRS_aud	93	0.022917	0.367508	0.657916
PRS_aud	94	0.020417	0.220278	0.531993
PRS_aud	95	−0.046890	0.0294459	0.328878
PRS_aud	96	0.009475	0.572258	0.783412
PRS_aud	97	−0.047507	0.12943	0.434902
PRS_aud	98	0.052663	0.0131933	0.307044
PRS_aud	99	0.030556	0.230526	0.547903
PRS_aud	100	−0.032488	0.0895064	0.411557
PRS_aud	101	−0.056816	0.0113939	0.307044
PRS_aud	102	−0.036959	0.0973957	0.411557
PRS_aud	103	0.017946	0.423357	0.702862
PRS_aud	104	0.048194	0.0347752	0.328878
PRS_aud	105	−0.006556	0.715521	0.880641
PRS_aud	106	−0.041596	0.11456	0.414308
PRS_aud	107	−0.004623	0.819704	0.924725
PRS_aud	108	0.045540	0.0395127	0.348801
PRS_aud	109	0.063762	0.0472546	0.357726
PRS_aud	110	−0.016742	0.389164	0.664174
PRS_aud	111	−0.009534	0.594681	0.805494
PRS_aud	112	0.014408	0.425187	0.702862
PRS_aud	113	0.004486	0.829092	0.924725
PRS_aud	114	−0.034366	0.207124	0.524448
PRS_aud	115	0.042101	0.0313938	0.328878
PRS_aud	116	−0.019193	0.311966	0.619095
PRS_aud	117	−0.010170	0.698832	0.880641
PRS_aud	118	−0.017994	0.34984	0.646753
PRS_aud	119	0.007250	0.726823	0.886291

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	120	−0.014698	0.526806	0.778486
PRS_aud	121	0.040118	0.0967529	0.411557
PRS_aud	122	−0.034139	0.105812	0.411557
PRS_aud	123	−0.009391	0.744387	0.896543
PRS_aud	124	0.044413	0.0331496	0.328878
PRS_aud	125	0.013117	0.428307	0.702862
PRS_aud	126	−0.009979	0.646575	0.84022
PRS_aud	127	0.043257	0.134208	0.434902
PRS_aud	128	−0.016815	0.335308	0.646753
PRS_aud	129	0.010814	0.565874	0.778838
PRS_aud	130	0.020563	0.24025	0.552655
PRS_aud	131	0.014195	0.431211	0.70312
PRS_aud	132	−0.038316	0.0728565	0.403878
PRS_aud	133	0.001020	0.980427	0.985352
PRS_aud	134	0.030677	0.121411	0.425769
PRS_aud	135	−0.029270	0.103762	0.411557
PRS_aud	136	−0.021240	0.386655	0.664174
PRS_aud	137	0.000488	0.981503	0.985352
PRS_aud	138	0.000654	0.980173	0.985352
PRS_aud	139	0.030229	0.167762	0.471946
PRS_aud	140	−0.025751	0.269591	0.57996
PRS_aud	141	−0.032307	0.106105	0.411557
PRS_aud	142	0.010171	0.540568	0.778486
PRS_aud	143	−0.039053	0.0286548	0.328878
PRS_aud	144	0.037784	0.0289892	0.328878
PRS_aud	145	0.012404	0.548466	0.778486
PRS_aud	146	−0.049763	0.110568	0.412265
PRS_aud	147	−0.001463	0.928854	0.973755
PRS_aud	148	0.033421	0.160917	0.468123
PRS_aud	149	−0.013685	0.42597	0.702862
PRS_aud	150	0.004808	0.790248	0.92356
PRS_aud	151	−0.012181	0.586974	0.799284
PRS_aud	152	0.027534	0.116524	0.414308
PRS_aud	153	0.072244	0.0195261	0.328878
PRS_aud	154	0.003398	0.843353	0.924725
PRS_aud	155	0.008698	0.616082	0.825744
PRS_aud	156	−0.051124	0.0948895	0.411557
PRS_aud	157	−0.042592	0.111024	0.412265
PRS_aud	158	−0.002260	0.912971	0.968319
PRS_aud	159	0.057385	0.0109948	0.307044
PRS_aud	160	−0.010923	0.508529	0.761306
PRS_aud	161	0.001431	0.942725	0.980067
PRS_aud	162	0.044935	0.105915	0.411557

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	163	−0.029084	0.10488	0.411557
PRS_aud	164	0.026038	0.123342	0.426697
PRS_aud	165	0.004655	0.876924	0.947415
PRS_aud	166	0.055865	0.137722	0.437546
PRS_aud	167	0.014335	0.451881	0.727557
PRS_aud	168	−0.056686	0.00750295	0.307044
PRS_aud	169	−0.023523	0.258089	0.566484
PRS_aud	170	−0.020727	0.558062	0.778486
PRS_aud	171	0.026147	0.131409	0.434902
PRS_aud	172	−0.037153	0.111118	0.412265
PRS_aud	173	0.019971	0.240924	0.552655
PRS_aud	174	−0.020066	0.351006	0.646753
PRS_aud	175	−0.005576	0.752956	0.896543
PRS_aud	176	0.053041	0.0123397	0.307044
PRS_aud	177	−0.015046	0.386708	0.664174
PRS_aud	178	−0.025054	0.308916	0.619095
PRS_aud	179	0.026928	0.0928308	0.411557
PRS_aud	180	0.004731	0.785385	0.922287
PRS_aud	181	−0.002091	0.917647	0.968319
PRS_aud	182	0.005021	0.816427	0.924725
PRS_aud	183	0.024476	0.243826	0.552655
PRS_aud	184	0.024154	0.34127	0.646753
PRS_aud	185	0.009393	0.632646	0.830551
PRS_aud	186	0.001398	0.931914	0.973755
PRS_aud	187	−0.011662	0.559537	0.778486
PRS_aud	188	−0.005348	0.840659	0.924725
PRS_aud	189	−0.018118	0.279407	0.585249
PRS_aud	190	−0.053040	0.00462756	0.307044
PRS_aud	191	−0.066161	0.0474487	0.357726
PRS_aud	192	0.044814	0.079428	0.411557
PRS_aud	193	0.048033	0.0477853	0.357726
PRS_aud	194	−0.009591	0.611704	0.824191
PRS_aud	195	0.005022	0.782057	0.922287
PRS_aud	196	−0.020161	0.215108	0.529497
PRS_aud	197	0.002577	0.895333	0.955022
PRS_aud	198	−0.017274	0.400029	0.673733
PRS_aud	199	0.003483	0.83756	0.924725
PRS_aud	200	−0.018751	0.265278	0.575518
PRS_aud	201	−0.038003	0.105541	0.411557
PRS_aud	202	0.001439	0.945611	0.980067
PRS_aud	203	0.022277	0.285295	0.588536
PRS_aud	204	0.050588	0.0517295	0.357726
PRS_aud	205	0.001027	0.955529	0.982391

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	206	0.017625	0.35057	0.646753
PRS_aud	207	0.003583	0.850854	0.926888
PRS_aud	208	−0.036916	0.0571115	0.360071
PRS_aud	209	0.026285	0.190113	0.496623
PRS_aud	210	−0.042297	0.026885	0.328878
PRS_aud	211	0.025774	0.139351	0.437546
PRS_aud	212	−0.007945	0.777421	0.921388
PRS_aud	213	0.007269	0.67382	0.871201
PRS_aud	214	0.011453	0.548524	0.778486
PRS_aud	215	−0.046418	0.0544973	0.357726
PRS_aud	216	−0.009407	0.749919	0.896543
PRS_aud	217	−0.029598	0.166965	0.471946
PRS_aud	218	0.063735	0.0120405	0.307044
PRS_aud	219	−0.006675	0.796726	0.92356
PRS_aud	220	0.026056	0.128801	0.434902
PRS_aud	221	−0.067942	0.0101901	0.307044
PRS_aud	222	−0.019315	0.231147	0.547903
PRS_aud	223	−0.016156	0.367379	0.657916
PRS_aud	224	−0.014874	0.376201	0.664174
PRS_aud	225	0.023138	0.258901	0.566484
PRS_aud	226	0.012960	0.55697	0.778486
PRS_aud	227	0.012091	0.469645	0.738998
PRS_aud	228	0.035766	0.103425	0.411557
PRS_aud	229	0.076534	0.021497	0.328878
PRS_aud	230	0.000716	0.976999	0.985352
PRS_aud	231	0.024262	0.183798	0.493811
PRS_aud	232	0.037890	0.0540084	0.357726
PRS_aud	233	0.017447	0.374913	0.664174
PRS_aud	234	−0.014148	0.39397	0.667923
PRS_aud	235	−0.033334	0.070726	0.403878
PRS_aud	236	−0.031627	0.101208	0.411557
PRS_aud	237	−0.037998	0.0967896	0.411557
PRS_aud	238	−0.008177	0.625706	0.827366
PRS_aud	239	−0.021315	0.243945	0.552655
PRS_aud	240	0.003244	0.843941	0.924725
PRS_aud	241	0.045768	0.0682536	0.403878
PRS_aud	242	0.041986	0.115719	0.414308
PRS_aud	243	0.023751	0.461574	0.738518
PRS_aud	244	0.045017	0.0864993	0.411557
PRS_aud	245	0.003379	0.845257	0.924725
PRS_aud	246	0.025992	0.150048	0.445827
PRS_aud	247	0.008493	0.708375	0.880641
PRS_aud	248	0.017685	0.379127	0.664174

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	249	0.012198	0.626988	0.827366
PRS_aud	250	−0.077241	0.0198024	0.328878
PRS_aud	251	−0.031125	0.134092	0.434902
PRS_aud	252	−0.033332	0.21043	0.524448
PRS_aud	253	0.006440	0.808115	0.92356
PRS_aud	254	0.023892	0.351166	0.646753
PRS_aud	255	0.006217	0.727036	0.886291
PRS_anx	0	−0.024998	0.259116	0.997622
PRS_anx	1	0.001853	0.962577	0.997622
PRS_anx	2	−0.002155	0.927834	0.997622
PRS_anx	3	0.022447	0.276053	0.997622
PRS_anx	4	0.047592	0.040199	0.989404
PRS_anx	5	−0.045795	0.0404798	0.989404
PRS_anx	6	0.068137	0.0198443	0.989404
PRS_anx	7	0.038882	0.168772	0.997622
PRS_anx	8	0.022628	0.237322	0.997622
PRS_anx	9	−0.006834	0.738218	0.997622
PRS_anx	10	−0.012973	0.60444	0.997622
PRS_anx	11	0.059598	0.155735	0.997622
PRS_anx	12	−0.001775	0.935369	0.997622
PRS_anx	13	0.018353	0.415284	0.997622
PRS_anx	14	0.060196	0.0425135	0.989404
PRS_anx	15	0.001948	0.921258	0.997622
PRS_anx	16	−0.014501	0.552714	0.997622
PRS_anx	17	−0.016418	0.607515	0.997622
PRS_anx	18	−0.000351	0.988452	0.997622
PRS_anx	19	−0.014549	0.655177	0.997622
PRS_anx	20	0.017351	0.39039	0.997622
PRS_anx	21	−0.001532	0.937062	0.997622
PRS_anx	22	−0.014760	0.609055	0.997622
PRS_anx	23	0.002483	0.906507	0.997622
PRS_anx	24	−0.000317	0.990593	0.997622
PRS_anx	25	0.037844	0.100934	0.997622
PRS_anx	26	−0.031670	0.293254	0.997622
PRS_anx	27	−0.037655	0.250979	0.997622
PRS_anx	28	−0.018799	0.353249	0.997622
PRS_anx	29	0.028562	0.233839	0.997622
PRS_anx	30	−0.010709	0.610215	0.997622
PRS_anx	31	−0.000897	0.967677	0.997622
PRS_anx	32	−0.006059	0.877579	0.997622
PRS_anx	33	−0.018285	0.462647	0.997622
PRS_anx	34	0.038777	0.12983	0.997622
PRS_anx	35	−0.017879	0.434284	0.997622

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	36	0.031207	0.258244	0.997622
PRS_anx	37	0.003345	0.888154	0.997622
PRS_anx	38	−0.014104	0.497121	0.997622
PRS_anx	39	0.042970	0.0630476	0.997622
PRS_anx	40	0.003804	0.858307	0.997622
PRS_anx	41	0.023731	0.337758	0.997622
PRS_anx	42	0.015036	0.446046	0.997622
PRS_anx	43	−0.024650	0.293695	0.997622
PRS_anx	44	−0.012172	0.690423	0.997622
PRS_anx	45	−0.011910	0.598932	0.997622
PRS_anx	46	0.024658	0.562448	0.997622
PRS_anx	47	0.012102	0.609177	0.997622
PRS_anx	48	0.014623	0.535324	0.997622
PRS_anx	49	−0.033001	0.344395	0.997622
PRS_anx	50	−0.015393	0.60963	0.997622
PRS_anx	51	−0.011924	0.55449	0.997622
PRS_anx	52	−0.003992	0.8558	0.997622
PRS_anx	53	0.031752	0.178242	0.997622
PRS_anx	54	0.036430	0.236775	0.997622
PRS_anx	55	0.029117	0.258774	0.997622
PRS_anx	56	−0.005239	0.865269	0.997622
PRS_anx	57	0.004364	0.82715	0.997622
PRS_anx	58	0.005424	0.805424	0.997622
PRS_anx	59	0.071621	0.160887	0.997622
PRS_anx	60	0.040994	0.227187	0.997622
PRS_anx	61	−0.020979	0.501537	0.997622
PRS_anx	62	−0.030036	0.346838	0.997622
PRS_anx	63	−0.024890	0.262183	0.997622
PRS_anx	64	0.000938	0.967199	0.997622
PRS_anx	65	0.020638	0.306085	0.997622
PRS_anx	66	0.028940	0.189324	0.997622
PRS_anx	67	−0.003604	0.88299	0.997622
PRS_anx	68	0.005371	0.81316	0.997622
PRS_anx	69	0.001696	0.934521	0.997622
PRS_anx	70	−0.013554	0.783923	0.997622
PRS_anx	71	−0.010583	0.698042	0.997622
PRS_anx	72	0.018300	0.669093	0.997622
PRS_anx	73	−0.028836	0.333159	0.997622
PRS_anx	74	−0.003685	0.911717	0.997622
PRS_anx	75	0.015278	0.722441	0.997622
PRS_anx	76	0.007522	0.770164	0.997622
PRS_anx	77	−0.011702	0.665802	0.997622
PRS_anx	78	−0.022513	0.300888	0.997622

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	79	−0.012619	0.597566	0.997622
PRS_anx	80	−0.046215	0.2078	0.997622
PRS_anx	81	−0.018663	0.482185	0.997622
PRS_anx	82	−0.032907	0.248988	0.997622
PRS_anx	83	−0.020372	0.373255	0.997622
PRS_anx	84	−0.030364	0.351068	0.997622
PRS_anx	85	0.005342	0.805673	0.997622
PRS_anx	86	0.002504	0.916964	0.997622
PRS_anx	87	−0.001058	0.956728	0.997622
PRS_anx	88	−0.019170	0.468515	0.997622
PRS_anx	89	0.020736	0.446908	0.997622
PRS_anx	90	−0.069312	0.129709	0.997622
PRS_anx	91	0.007661	0.795048	0.997622
PRS_anx	92	−0.032242	0.261093	0.997622
PRS_anx	93	0.040122	0.208118	0.997622
PRS_anx	94	0.017872	0.368978	0.997622
PRS_anx	95	−0.028186	0.338368	0.997622
PRS_anx	96	0.011983	0.551225	0.997622
PRS_anx	97	−0.039140	0.338854	0.997622
PRS_anx	98	0.033957	0.250372	0.997622
PRS_anx	99	−0.014362	0.644089	0.997622
PRS_anx	100	−0.014343	0.565573	0.997622
PRS_anx	101	−0.024781	0.388115	0.997622
PRS_anx	102	−0.029348	0.32457	0.997622
PRS_anx	103	0.049063	0.0846761	0.997622
PRS_anx	104	0.041353	0.165338	0.997622
PRS_anx	105	0.004645	0.846084	0.997622
PRS_anx	106	0.038630	0.232114	0.997622
PRS_anx	107	−0.031298	0.213814	0.997622
PRS_anx	108	0.045023	0.120738	0.997622
PRS_anx	109	0.051752	0.181634	0.997622
PRS_anx	110	0.002586	0.90949	0.997622
PRS_anx	111	0.019831	0.352269	0.997622
PRS_anx	112	0.013726	0.539976	0.997622
PRS_anx	113	−0.041192	0.126638	0.997622
PRS_anx	114	−0.014725	0.658797	0.997622
PRS_anx	115	0.034577	0.195699	0.997622
PRS_anx	116	0.000010	0.999667	0.999667
PRS_anx	117	−0.018992	0.570439	0.997622
PRS_anx	118	−0.029695	0.207113	0.997622
PRS_anx	119	0.006289	0.810186	0.997622
PRS_anx	120	−0.025295	0.410685	0.997622
PRS_anx	121	0.014209	0.664618	0.997622

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	122	0.013151	0.60825	0.997622
PRS_anx	123	0.033611	0.356	0.997622
PRS_anx	124	0.027799	0.312444	0.997622
PRS_anx	125	−0.003776	0.842959	0.997622
PRS_anx	126	−0.002016	0.941551	0.997622
PRS_anx	127	−0.038693	0.270357	0.997622
PRS_anx	128	0.013768	0.522333	0.997622
PRS_anx	129	0.052748	0.0196264	0.989404
PRS_anx	130	0.039303	0.0764722	0.997622
PRS_anx	131	0.012341	0.568797	0.997622
PRS_anx	132	0.022155	0.42098	0.997622
PRS_anx	133	−0.027349	0.612018	0.997622
PRS_anx	134	0.025203	0.322511	0.997622
PRS_anx	135	−0.001954	0.933531	0.997622
PRS_anx	136	−0.007077	0.833863	0.997622
PRS_anx	137	0.011872	0.653448	0.997622
PRS_anx	138	−0.007403	0.818071	0.997622
PRS_anx	139	0.023696	0.345102	0.997622
PRS_anx	140	−0.046889	0.111169	0.997622
PRS_anx	141	−0.018547	0.455887	0.997622
PRS_anx	142	−0.010075	0.618905	0.997622
PRS_anx	143	−0.027030	0.224666	0.997622
PRS_anx	144	0.005964	0.796585	0.997622
PRS_anx	145	0.015844	0.553701	0.997622
PRS_anx	146	−0.093858	0.0257743	0.989404
PRS_anx	147	−0.011574	0.544176	0.997622
PRS_anx	148	0.048918	0.111925	0.997622
PRS_anx	149	−0.000306	0.98943	0.997622
PRS_anx	150	−0.014605	0.489932	0.997622
PRS_anx	151	0.016002	0.563918	0.997622
PRS_anx	152	0.032972	0.144985	0.997622
PRS_anx	153	0.042710	0.316851	0.997622
PRS_anx	154	0.010481	0.629484	0.997622
PRS_anx	155	−0.006019	0.771471	0.997622
PRS_anx	156	−0.095622	0.0103891	0.989404
PRS_anx	157	−0.033378	0.31552	0.997622
PRS_anx	158	0.002970	0.906435	0.997622
PRS_anx	159	0.005977	0.837653	0.997622
PRS_anx	160	−0.002833	0.884277	0.997622
PRS_anx	161	−0.006898	0.774651	0.997622
PRS_anx	162	0.032956	0.373292	0.997622
PRS_anx	163	−0.004109	0.861054	0.997622
PRS_anx	164	0.007098	0.766204	0.997622

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	165	−0.006410	0.865234	0.997622
PRS_anx	166	0.060528	0.203264	0.997622
PRS_anx	167	−0.008081	0.720176	0.997622
PRS_anx	168	−0.058557	0.0392978	0.989404
PRS_anx	169	−0.001277	0.961476	0.997622
PRS_anx	170	0.005166	0.908133	0.997622
PRS_anx	171	0.001538	0.941208	0.997622
PRS_anx	172	0.003402	0.903198	0.997622
PRS_anx	173	0.044900	0.0371491	0.989404
PRS_anx	174	0.012359	0.651603	0.997622
PRS_anx	175	−0.006209	0.769589	0.997622
PRS_anx	176	0.028551	0.291395	0.997622
PRS_anx	177	0.004866	0.826269	0.997622
PRS_anx	178	−0.054799	0.0757871	0.997622
PRS_anx	179	0.000150	0.993725	0.997622
PRS_anx	180	−0.038138	0.0562491	0.997622
PRS_anx	181	0.008083	0.758813	0.997622
PRS_anx	182	−0.034041	0.222272	0.997622
PRS_anx	183	−0.022245	0.412514	0.997622
PRS_anx	184	−0.017924	0.568004	0.997622
PRS_anx	185	0.015262	0.566899	0.997622
PRS_anx	186	0.006417	0.734557	0.997622
PRS_anx	187	0.005895	0.810943	0.997622
PRS_anx	188	−0.014380	0.677812	0.997622
PRS_anx	189	−0.013094	0.559367	0.997622
PRS_anx	190	−0.050607	0.0416875	0.989404
PRS_anx	191	−0.073413	0.101396	0.997622
PRS_anx	192	0.016464	0.611923	0.997622
PRS_anx	193	0.023255	0.468963	0.997622
PRS_anx	194	0.046275	0.0418359	0.989404
PRS_anx	195	0.007136	0.742007	0.997622
PRS_anx	196	−0.005752	0.791373	0.997622
PRS_anx	197	0.044701	0.0754421	0.997622
PRS_anx	198	−0.010708	0.657706	0.997622
PRS_anx	199	0.000781	0.967929	0.997622
PRS_anx	200	0.001376	0.948223	0.997622
PRS_anx	201	0.003088	0.918155	0.997622
PRS_anx	202	0.021898	0.41412	0.997622
PRS_anx	203	−0.046303	0.0698469	0.997622
PRS_anx	204	0.004717	0.89185	0.997622
PRS_anx	205	−0.005129	0.819099	0.997622
PRS_anx	206	0.008217	0.71216	0.997622
PRS_anx	207	0.015363	0.493442	0.997622

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	208	−0.000614	0.980711	0.997622
PRS_anx	209	0.002786	0.909853	0.997622
PRS_anx	210	−0.020916	0.415058	0.997622
PRS_anx	211	0.000990	0.961983	0.997622
PRS_anx	212	−0.001039	0.976753	0.997622
PRS_anx	213	0.015909	0.470426	0.997622
PRS_anx	214	−0.004191	0.854859	0.997622
PRS_anx	215	0.042478	0.159937	0.997622
PRS_anx	216	0.033139	0.386892	0.997622
PRS_anx	217	−0.003650	0.898738	0.997622
PRS_anx	218	0.028745	0.372631	0.997622
PRS_anx	219	0.012225	0.726971	0.997622
PRS_anx	220	0.033463	0.119611	0.997622
PRS_anx	221	−0.043000	0.224612	0.997622
PRS_anx	222	−0.004381	0.823542	0.997622
PRS_anx	223	0.011671	0.585792	0.997622
PRS_anx	224	−0.010184	0.602004	0.997622
PRS_anx	225	0.016842	0.518252	0.997622
PRS_anx	226	0.039450	0.148494	0.997622
PRS_anx	227	0.006400	0.756788	0.997622
PRS_anx	228	0.025809	0.362539	0.997622
PRS_anx	229	0.059295	0.190836	0.997622
PRS_anx	230	0.056676	0.0811262	0.997622
PRS_anx	231	−0.010942	0.632942	0.997622
PRS_anx	232	0.019417	0.432904	0.997622
PRS_anx	233	0.016810	0.492575	0.997622
PRS_anx	234	−0.021286	0.293217	0.997622
PRS_anx	235	−0.014175	0.590574	0.997622
PRS_anx	236	−0.036693	0.120806	0.997622
PRS_anx	237	−0.028724	0.357058	0.997622
PRS_anx	238	−0.014269	0.487681	0.997622
PRS_anx	239	−0.022444	0.303529	0.997622
PRS_anx	240	0.004781	0.811398	0.997622
PRS_anx	241	0.003246	0.923877	0.997622
PRS_anx	242	0.044291	0.197147	0.997622
PRS_anx	243	−0.007617	0.853497	0.997622
PRS_anx	244	−0.017152	0.59434	0.997622
PRS_anx	245	0.013997	0.491896	0.997622
PRS_anx	246	0.011516	0.598835	0.997622
PRS_anx	247	−0.010073	0.717118	0.997622
PRS_anx	248	0.039958	0.130903	0.997622
PRS_anx	249	−0.017948	0.58483	0.997622
PRS_anx	250	−0.011814	0.78357	0.997622

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	251	0.015245	0.574309	0.997622
PRS_anx	252	−0.016262	0.643462	0.997622
PRS_anx	253	0.000405	0.990171	0.997622
PRS_anx	254	0.028376	0.396555	0.997622
PRS_anx	255	−0.002902	0.893573	0.997622
PRS_mdd	0	−0.011995	0.61364	0.999498
PRS_mdd	1	−0.096398	0.0546984	0.999498
PRS_mdd	2	−0.019845	0.45295	0.999498
PRS_mdd	3	−0.006833	0.765701	0.999498
PRS_mdd	4	0.009259	0.717539	0.999498
PRS_mdd	5	0.027721	0.273012	0.999498
PRS_mdd	6	0.005018	0.883149	0.999498
PRS_mdd	7	−0.000072	0.998194	0.999498
PRS_mdd	8	0.009158	0.667466	0.999498
PRS_mdd	9	−0.009870	0.641068	0.999498
PRS_mdd	10	−0.011224	0.708624	0.999498
PRS_mdd	11	−0.007921	0.868396	0.999498
PRS_mdd	12	−0.000406	0.986123	0.999498
PRS_mdd	13	0.002939	0.91615	0.999498
PRS_mdd	14	−0.010938	0.734556	0.999498
PRS_mdd	15	−0.003435	0.870864	0.999498
PRS_mdd	16	0.009163	0.739348	0.999498
PRS_mdd	17	−0.017851	0.607074	0.999498
PRS_mdd	18	−0.015047	0.617695	0.999498
PRS_mdd	19	0.056226	0.117777	0.999498
PRS_mdd	20	−0.004631	0.83352	0.999498
PRS_mdd	21	−0.007255	0.740328	0.999498
PRS_mdd	22	−0.022888	0.453281	0.999498
PRS_mdd	23	−0.012323	0.611875	0.999498
PRS_mdd	24	0.025669	0.385747	0.999498
PRS_mdd	25	−0.001341	0.961409	0.999498
PRS_mdd	26	0.012957	0.684223	0.999498
PRS_mdd	27	−0.040091	0.31028	0.999498
PRS_mdd	28	−0.001705	0.938979	0.999498
PRS_mdd	29	−0.045774	0.0813684	0.999498
PRS_mdd	30	0.010801	0.6306	0.999498
PRS_mdd	31	0.016117	0.514408	0.999498
PRS_mdd	32	0.013040	0.755546	0.999498
PRS_mdd	33	−0.028470	0.309726	0.999498
PRS_mdd	34	−0.017716	0.53375	0.999498
PRS_mdd	35	0.006558	0.78608	0.999498
PRS_mdd	36	−0.024503	0.523876	0.999498
PRS_mdd	37	0.000561	0.982407	0.999498

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	38	0.002037	0.926807	0.999498
PRS_mdd	39	0.026104	0.35743	0.999498
PRS_mdd	40	0.022710	0.329442	0.999498
PRS_mdd	41	−0.023356	0.406501	0.999498
PRS_mdd	42	−0.002094	0.923805	0.999498
PRS_mdd	43	−0.021727	0.391103	0.999498
PRS_mdd	44	0.022314	0.531661	0.999498
PRS_mdd	45	0.013062	0.589352	0.999498
PRS_mdd	46	0.104269	0.0297737	0.999498
PRS_mdd	47	0.002233	0.926143	0.999498
PRS_mdd	48	0.028939	0.279459	0.999498
PRS_mdd	49	0.034015	0.398848	0.999498
PRS_mdd	50	−0.014111	0.676725	0.999498
PRS_mdd	51	−0.002083	0.926729	0.999498
PRS_mdd	52	0.000416	0.985903	0.999498
PRS_mdd	53	−0.001843	0.944448	0.999498
PRS_mdd	54	−0.020645	0.527539	0.999498
PRS_mdd	55	−0.001595	0.953272	0.999498
PRS_mdd	56	0.040093	0.248793	0.999498
PRS_mdd	57	−0.019850	0.343413	0.999498
PRS_mdd	58	0.012388	0.590626	0.999498
PRS_mdd	59	0.022321	0.682503	0.999498
PRS_mdd	60	0.001404	0.973918	0.999498
PRS_mdd	61	−0.020825	0.534822	0.999498
PRS_mdd	62	0.029215	0.469551	0.999498
PRS_mdd	63	0.009186	0.699841	0.999498
PRS_mdd	64	0.001729	0.942733	0.999498
PRS_mdd	65	0.000699	0.974989	0.999498
PRS_mdd	66	−0.016601	0.485707	0.999498
PRS_mdd	67	0.004245	0.87211	0.999498
PRS_mdd	68	−0.005926	0.830121	0.999498
PRS_mdd	69	0.007751	0.720844	0.999498
PRS_mdd	70	0.042159	0.475476	0.999498
PRS_mdd	71	0.005232	0.857092	0.999498
PRS_mdd	72	−0.067553	0.162297	0.999498
PRS_mdd	73	0.015373	0.691128	0.999498
PRS_mdd	74	−0.003679	0.918461	0.999498
PRS_mdd	75	−0.015643	0.741633	0.999498
PRS_mdd	76	−0.030411	0.26535	0.999498
PRS_mdd	77	0.050413	0.086994	0.999498
PRS_mdd	78	0.015822	0.504421	0.999498
PRS_mdd	79	0.006481	0.802006	0.999498
PRS_mdd	80	0.007876	0.853646	0.999498

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	81	−0.003001	0.916213	0.999498
PRS_mdd	82	0.023909	0.503352	0.999498
PRS_mdd	83	−0.018956	0.439227	0.999498
PRS_mdd	84	−0.041457	0.240933	0.999498
PRS_mdd	85	0.037415	0.111982	0.999498
PRS_mdd	86	0.010139	0.679488	0.999498
PRS_mdd	87	0.009832	0.678744	0.999498
PRS_mdd	88	−0.009620	0.734092	0.999498
PRS_mdd	89	−0.030881	0.29949	0.999498
PRS_mdd	90	0.012016	0.812026	0.999498
PRS_mdd	91	0.021946	0.478306	0.999498
PRS_mdd	92	0.007779	0.801702	0.999498
PRS_mdd	93	−0.013696	0.69605	0.999498
PRS_mdd	94	−0.002842	0.895166	0.999498
PRS_mdd	95	0.032147	0.300363	0.999498
PRS_mdd	96	0.001586	0.943805	0.999498
PRS_mdd	97	−0.009879	0.824708	0.999498
PRS_mdd	98	−0.046351	0.199004	0.999498
PRS_mdd	99	−0.047624	0.15629	0.999498
PRS_mdd	100	0.002644	0.926898	0.999498
PRS_mdd	101	0.034293	0.260989	0.999498
PRS_mdd	102	0.016378	0.608792	0.999498
PRS_mdd	103	0.026463	0.388189	0.999498
PRS_mdd	104	−0.051667	0.123645	0.999498
PRS_mdd	105	−0.022979	0.372283	0.999498
PRS_mdd	106	0.061692	0.109073	0.999498
PRS_mdd	107	0.000283	0.991802	0.999498
PRS_mdd	108	−0.026382	0.413277	0.999498
PRS_mdd	109	−0.044612	0.357374	0.999498
PRS_mdd	110	0.003229	0.900049	0.999498
PRS_mdd	111	0.016127	0.473685	0.999498
PRS_mdd	112	−0.022409	0.414571	0.999498
PRS_mdd	113	−0.030156	0.325567	0.999498
PRS_mdd	114	0.015090	0.712935	0.999498
PRS_mdd	115	0.000018	0.999498	0.999498
PRS_mdd	116	−0.001304	0.96151	0.999498
PRS_mdd	117	−0.001296	0.972196	0.999498
PRS_mdd	118	0.021438	0.402378	0.999498
PRS_mdd	119	−0.000146	0.995602	0.999498
PRS_mdd	120	0.013088	0.672444	0.999498
PRS_mdd	121	−0.025539	0.543081	0.999498
PRS_mdd	122	0.005620	0.841303	0.999498
PRS_mdd	123	0.003398	0.939254	0.999498

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	124	−0.026949	0.394234	0.999498
PRS_mdd	125	−0.003703	0.853358	0.999498
PRS_mdd	126	−0.010439	0.719465	0.999498
PRS_mdd	127	−0.042139	0.255	0.999498
PRS_mdd	128	−0.005132	0.834712	0.999498
PRS_mdd	129	−0.002121	0.938098	0.999498
PRS_mdd	130	0.008343	0.721438	0.999498
PRS_mdd	131	−0.000666	0.977365	0.999498
PRS_mdd	132	0.018689	0.556305	0.999498
PRS_mdd	133	0.054894	0.377295	0.999498
PRS_mdd	134	−0.013764	0.614941	0.999498
PRS_mdd	135	0.004846	0.869555	0.999498
PRS_mdd	136	−0.028721	0.473347	0.999498
PRS_mdd	137	−0.003736	0.895495	0.999498
PRS_mdd	138	−0.033244	0.324489	0.999498
PRS_mdd	139	−0.002375	0.933834	0.999498
PRS_mdd	140	0.034026	0.309557	0.999498
PRS_mdd	141	0.028974	0.297207	0.999498
PRS_mdd	142	−0.014118	0.539824	0.999498
PRS_mdd	143	0.027902	0.248491	0.999498
PRS_mdd	144	−0.009707	0.689188	0.999498
PRS_mdd	145	−0.019862	0.516833	0.999498
PRS_mdd	146	0.018564	0.696916	0.999498
PRS_mdd	147	0.000107	0.996051	0.999498
PRS_mdd	148	−0.005654	0.865703	0.999498
PRS_mdd	149	0.016296	0.541022	0.999498
PRS_mdd	150	−0.013499	0.590044	0.999498
PRS_mdd	151	0.017622	0.592203	0.999498
PRS_mdd	152	−0.004242	0.864024	0.999498
PRS_mdd	153	−0.008159	0.877809	0.999498
PRS_mdd	154	0.011481	0.613544	0.999498
PRS_mdd	155	−0.006845	0.753906	0.999498
PRS_mdd	156	0.034621	0.464806	0.999498
PRS_mdd	157	−0.008872	0.818351	0.999498
PRS_mdd	158	0.011019	0.675614	0.999498
PRS_mdd	159	−0.051407	0.114365	0.999498
PRS_mdd	160	0.018184	0.384677	0.999498
PRS_mdd	161	−0.001891	0.940761	0.999498
PRS_mdd	162	−0.012602	0.75569	0.999498
PRS_mdd	163	0.008757	0.748563	0.999498
PRS_mdd	164	−0.010755	0.678217	0.999498
PRS_mdd	165	0.042718	0.323675	0.999498
PRS_mdd	166	−0.030866	0.629428	0.999498

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	167	−0.021887	0.37126	0.999498
PRS_mdd	168	0.027652	0.388769	0.999498
PRS_mdd	169	0.024540	0.387753	0.999498
PRS_mdd	170	0.053042	0.277032	0.999498
PRS_mdd	171	−0.019954	0.3675	0.999498
PRS_mdd	172	0.030888	0.366542	0.999498
PRS_mdd	173	0.022119	0.400243	0.999498
PRS_mdd	174	0.004073	0.884005	0.999498
PRS_mdd	175	−0.003182	0.891768	0.999498
PRS_mdd	176	−0.053912	0.0798716	0.999498
PRS_mdd	177	0.035101	0.173399	0.999498
PRS_mdd	178	0.000471	0.988618	0.999498
PRS_mdd	179	−0.012503	0.587041	0.999498
PRS_mdd	180	−0.014854	0.501024	0.999498
PRS_mdd	181	0.021093	0.447575	0.999498
PRS_mdd	182	−0.030602	0.333222	0.999498
PRS_mdd	183	−0.015300	0.593825	0.999498
PRS_mdd	184	−0.035435	0.293392	0.999498
PRS_mdd	185	−0.060774	0.0377297	0.999498
PRS_mdd	186	−0.004185	0.847914	0.999498
PRS_mdd	187	0.012817	0.620578	0.999498
PRS_mdd	188	0.019090	0.613155	0.999498
PRS_mdd	189	0.027916	0.254966	0.999498
PRS_mdd	190	0.032790	0.263049	0.999498
PRS_mdd	191	0.012821	0.812059	0.999498
PRS_mdd	192	−0.036611	0.309802	0.999498
PRS_mdd	193	−0.044921	0.203253	0.999498
PRS_mdd	194	0.014433	0.575878	0.999498
PRS_mdd	195	0.010112	0.660925	0.999498
PRS_mdd	196	−0.008713	0.73709	0.999498
PRS_mdd	197	0.031044	0.249487	0.999498
PRS_mdd	198	0.020591	0.429972	0.999498
PRS_mdd	199	0.001045	0.962028	0.999498
PRS_mdd	200	0.018744	0.489404	0.999498
PRS_mdd	201	0.006298	0.85066	0.999498
PRS_mdd	202	0.014120	0.622612	0.999498
PRS_mdd	203	−0.037612	0.170374	0.999498
PRS_mdd	204	−0.026795	0.514344	0.999498
PRS_mdd	205	−0.001450	0.952718	0.999498
PRS_mdd	206	−0.019177	0.443506	0.999498
PRS_mdd	207	0.002327	0.919892	0.999498
PRS_mdd	208	0.011206	0.697816	0.999498
PRS_mdd	209	−0.024136	0.379262	0.999498

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	210	0.017735	0.524408	0.999498
PRS_mdd	211	−0.023828	0.299297	0.999498
PRS_mdd	212	−0.022835	0.535541	0.999498
PRS_mdd	213	−0.000628	0.979611	0.999498
PRS_mdd	214	−0.010874	0.647601	0.999498
PRS_mdd	215	0.078295	0.0204579	0.999498
PRS_mdd	216	−0.042588	0.363184	0.999498
PRS_mdd	217	0.023726	0.467253	0.999498
PRS_mdd	218	−0.034469	0.325623	0.999498
PRS_mdd	219	0.012441	0.720702	0.999498
PRS_mdd	220	−0.012999	0.597953	0.999498
PRS_mdd	221	0.031009	0.441523	0.999498
PRS_mdd	222	0.021116	0.322498	0.999498
PRS_mdd	223	0.018003	0.421796	0.999498
PRS_mdd	224	0.002258	0.91658	0.999498
PRS_mdd	225	0.009370	0.736446	0.999498
PRS_mdd	226	0.010931	0.70089	0.999498
PRS_mdd	227	−0.003451	0.88358	0.999498
PRS_mdd	228	−0.004703	0.883267	0.999498
PRS_mdd	229	0.009092	0.872043	0.999498
PRS_mdd	230	0.032439	0.356848	0.999498
PRS_mdd	231	−0.018033	0.471853	0.999498
PRS_mdd	232	−0.016826	0.586829	0.999498
PRS_mdd	233	−0.006240	0.809562	0.999498
PRS_mdd	234	−0.005263	0.820735	0.999498
PRS_mdd	235	−0.007313	0.80752	0.999498
PRS_mdd	236	0.005401	0.83259	0.999498
PRS_mdd	237	0.007505	0.845716	0.999498
PRS_mdd	238	−0.000144	0.995072	0.999498
PRS_mdd	239	−0.003650	0.872656	0.999498
PRS_mdd	240	0.013951	0.542001	0.999498
PRS_mdd	241	−0.021934	0.547612	0.999498
PRS_mdd	242	−0.014048	0.764603	0.999498
PRS_mdd	243	−0.024051	0.595077	0.999498
PRS_mdd	244	−0.013677	0.692626	0.999498
PRS_mdd	245	0.001945	0.930907	0.999498
PRS_mdd	246	−0.018566	0.456608	0.999498
PRS_mdd	247	0.017458	0.564261	0.999498
PRS_mdd	248	0.013617	0.628426	0.999498
PRS_mdd	249	−0.042823	0.214285	0.999498
PRS_mdd	250	0.031788	0.526386	0.999498
PRS_mdd	251	0.023825	0.443644	0.999498
PRS_mdd	252	0.004950	0.887441	0.999498

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	253	−0.008302	0.813676	0.999498
PRS_mdd	254	−0.022982	0.591817	0.999498
PRS_mdd	255	0.002652	0.909315	0.999498

3.4.2 With Symptoms

Table 15: Associations between polygenic risk scores (PRS) and brain normative deviations across embedding dimensions, after correcting for clinical symptom severity. "Dim" indicates the latent embedding dimension tested, and β_{PRS} is the regression coefficient for the PRS–deviation association. p-values are reported both uncorrected and after Benjamini–Hochberg false discovery rate (FDR) adjustment (p_{FDR}).

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	0	-0.023682	0.000373	0.003180
PRS_aud	1	-0.007940	0.004903	0.014102
PRS_aud	2	0.018082	0.006482	0.016442
PRS_aud	3	-0.018839	0.005078	0.014443
PRS_aud	4	0.012966	0.033827	0.057349
PRS_aud	5	-0.007933	0.229469	0.282424
PRS_aud	6	0.006905	0.137955	0.183939
PRS_aud	7	-0.002779	0.597324	0.642500
PRS_aud	8	0.024364	0.000801	0.004529
PRS_aud	9	-0.025096	0.000567	0.003838
PRS_aud	10	-0.013790	0.020451	0.038496
PRS_aud	11	-0.002114	0.426986	0.479423
PRS_aud	12	0.022255	0.000476	0.003693
PRS_aud	13	0.023821	0.000414	0.003314
PRS_aud	14	0.004994	0.275864	0.331555
PRS_aud	15	0.019742	0.004824	0.014035
PRS_aud	16	-0.010301	0.099572	0.138535
PRS_aud	17	0.011802	0.009089	0.021607
PRS_aud	18	0.017946	0.003339	0.010995
PRS_aud	19	0.014628	0.000098	0.001789
PRS_aud	20	0.016186	0.025584	0.046124
PRS_aud	21	-0.019871	0.004478	0.013488
PRS_aud	22	-0.020358	0.000073	0.001567
PRS_aud	23	-0.025808	0.000232	0.002588
PRS_aud	24	-0.006337	0.217850	0.270726
PRS_aud	25	0.020934	0.001173	0.005801
PRS_aud	26	0.008450	0.053964	0.083726
PRS_aud	27	-0.011586	0.006876	0.017089

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	28	-0.013214	0.065123	0.099235
PRS_aud	29	-0.009902	0.083452	0.120490
PRS_aud	30	-0.017286	0.014349	0.030357
PRS_aud	31	-0.016718	0.011146	0.025030
PRS_aud	32	-0.003657	0.242047	0.296479
PRS_aud	33	0.015315	0.009175	0.021607
PRS_aud	34	-0.005655	0.265258	0.321829
PRS_aud	35	0.017765	0.002747	0.009524
PRS_aud	36	0.008081	0.083778	0.120490
PRS_aud	37	0.016376	0.005344	0.014869
PRS_aud	38	0.013352	0.040902	0.067554
PRS_aud	39	-0.000804	0.884492	0.902111
PRS_aud	40	-0.012017	0.081479	0.118703
PRS_aud	41	-0.008270	0.101569	0.140549
PRS_aud	42	0.018914	0.010432	0.023633
PRS_aud	43	-0.021109	0.000256	0.002732
PRS_aud	44	-0.013088	0.007531	0.018538
PRS_aud	45	-0.019082	0.004256	0.012971
PRS_aud	46	-0.001899	0.542826	0.598980
PRS_aud	47	0.018812	0.002018	0.007753
PRS_aud	48	0.018018	0.003358	0.010995
PRS_aud	49	-0.004099	0.305781	0.362407
PRS_aud	50	0.010584	0.013250	0.028503
PRS_aud	51	-0.020773	0.003393	0.010995
PRS_aud	52	-0.023008	0.000894	0.004770
PRS_aud	53	-0.008778	0.137436	0.183939
PRS_aud	54	0.008948	0.044861	0.072414
PRS_aud	55	-0.012813	0.016800	0.034133
PRS_aud	56	0.013023	0.001529	0.007118
PRS_aud	57	-0.021210	0.003559	0.011247
PRS_aud	58	0.018118	0.009705	0.022183
PRS_aud	59	0.003301	0.113727	0.155691
PRS_aud	60	0.007298	0.051850	0.080936
PRS_aud	61	-0.007781	0.070887	0.106747
PRS_aud	62	-0.007826	0.049229	0.077794
PRS_aud	63	-0.015272	0.020105	0.038410
PRS_aud	64	-0.009256	0.122697	0.167077
PRS_aud	65	0.006994	0.284322	0.340124
PRS_aud	66	-0.014497	0.019826	0.038160
PRS_aud	67	-0.022608	0.000932	0.004871
PRS_aud	68	0.013632	0.027612	0.048749
PRS_aud	69	0.003314	0.641874	0.676213
PRS_aud	70	0.007621	0.000813	0.004529

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	71	0.004414	0.419276	0.472840
PRS_aud	72	-0.005855	0.019019	0.037411
PRS_aud	73	-0.014564	0.001980	0.007753
PRS_aud	74	0.007289	0.070140	0.106247
PRS_aud	75	-0.010640	0.000183	0.002286
PRS_aud	76	0.013085	0.026687	0.047443
PRS_aud	77	-0.000236	0.961478	0.962368
PRS_aud	78	-0.018837	0.005732	0.015551
PRS_aud	79	-0.022868	0.000588	0.003838
PRS_aud	80	-0.005068	0.222377	0.275017
PRS_aud	81	0.013614	0.006487	0.016442
PRS_aud	82	-0.014647	0.004195	0.012938
PRS_aud	83	-0.024485	0.000062	0.001539
PRS_aud	84	-0.007469	0.064951	0.099235
PRS_aud	85	-0.011487	0.063717	0.098262
PRS_aud	86	-0.014030	0.015768	0.032925
PRS_aud	87	-0.022442	0.001656	0.007436
PRS_aud	88	0.018594	0.002643	0.009524
PRS_aud	89	-0.007385	0.132730	0.178837
PRS_aud	90	0.005779	0.013151	0.028503
PRS_aud	91	-0.015347	0.002011	0.007753
PRS_aud	92	0.002654	0.569852	0.623428
PRS_aud	93	-0.003060	0.414181	0.469160
PRS_aud	94	0.019006	0.009330	0.021668
PRS_aud	95	-0.010319	0.035231	0.059336
PRS_aud	96	0.025048	0.000332	0.003144
PRS_aud	97	0.004556	0.143662	0.188603
PRS_aud	98	0.000299	0.953947	0.961458
PRS_aud	99	-0.000294	0.947816	0.959055
PRS_aud	100	-0.019456	0.001451	0.006880
PRS_aud	101	-0.009945	0.044976	0.072414
PRS_aud	102	-0.017867	0.000305	0.002999
PRS_aud	103	-0.010147	0.030648	0.053373
PRS_aud	104	0.007990	0.080298	0.118140
PRS_aud	105	-0.026341	0.000058	0.001539
PRS_aud	106	0.009533	0.017947	0.035895
PRS_aud	107	0.010182	0.044050	0.071827
PRS_aud	108	0.000377	0.932470	0.947271
PRS_aud	109	0.000855	0.774080	0.800361
PRS_aud	110	0.013513	0.019290	0.037411
PRS_aud	111	-0.006051	0.348140	0.399658
PRS_aud	112	0.003363	0.597271	0.642500
PRS_aud	113	0.009009	0.094026	0.132257

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	114	-0.004680	0.210352	0.263971
PRS_aud	115	0.016253	0.003522	0.011247
PRS_aud	116	-0.022668	0.000403	0.003314
PRS_aud	117	0.014672	0.000284	0.002903
PRS_aud	118	-0.019722	0.001201	0.005801
PRS_aud	119	0.019141	0.000686	0.004282
PRS_aud	120	-0.013343	0.006057	0.015822
PRS_aud	121	0.007343	0.088849	0.126363
PRS_aud	122	0.004023	0.434855	0.486126
PRS_aud	123	0.001617	0.632024	0.668587
PRS_aud	124	0.016915	0.001962	0.007753
PRS_aud	125	0.010990	0.124572	0.168733
PRS_aud	126	0.004932	0.345139	0.397998
PRS_aud	127	-0.007979	0.033045	0.056442
PRS_aud	128	0.008217	0.205750	0.260752
PRS_aud	129	0.013389	0.030923	0.053489
PRS_aud	130	-0.015624	0.016205	0.033456
PRS_aud	131	0.021786	0.001189	0.005801
PRS_aud	132	-0.005263	0.314805	0.366319
PRS_aud	133	0.000936	0.607810	0.651043
PRS_aud	134	0.018220	0.001977	0.007753
PRS_aud	135	-0.014133	0.022964	0.042270
PRS_aud	136	-0.007312	0.075083	0.111105
PRS_aud	137	0.005495	0.310674	0.363162
PRS_aud	138	-0.015654	0.000136	0.002055
PRS_aud	139	0.009005	0.094615	0.132358
PRS_aud	140	-0.011555	0.012733	0.027861
PRS_aud	141	0.009076	0.093291	0.131948
PRS_aud	142	-0.018879	0.007778	0.018964
PRS_aud	143	0.012953	0.040323	0.067031
PRS_aud	144	-0.012872	0.048291	0.076786
PRS_aud	145	0.001909	0.722846	0.752230
PRS_aud	146	0.001049	0.710480	0.745421
PRS_aud	147	-0.014762	0.042102	0.069090
PRS_aud	148	0.018250	0.000125	0.002055
PRS_aud	149	-0.005094	0.448329	0.499010
PRS_aud	150	-0.019636	0.001808	0.007712
PRS_aud	151	0.006621	0.199422	0.253991
PRS_aud	152	0.005885	0.329374	0.381537
PRS_aud	153	0.006758	0.029587	0.051879
PRS_aud	154	0.025852	0.000136	0.002055
PRS_aud	155	0.019387	0.004586	0.013651
PRS_aud	156	-0.003902	0.212147	0.264924

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	157	0.009780	0.023116	0.042270
PRS_aud	158	0.016043	0.003787	0.011822
PRS_aud	159	-0.004399	0.365540	0.415904
PRS_aud	160	0.014793	0.033071	0.056442
PRS_aud	161	-0.016759	0.002509	0.009175
PRS_aud	162	0.009657	0.016976	0.034220
PRS_aud	163	-0.020144	0.002025	0.007753
PRS_aud	164	0.006817	0.300310	0.357578
PRS_aud	165	0.010982	0.000366	0.003180
PRS_aud	166	0.001511	0.548584	0.602736
PRS_aud	167	0.006446	0.309680	0.363162
PRS_aud	168	-0.006644	0.139047	0.184435
PRS_aud	169	0.018042	0.000797	0.004529
PRS_aud	170	0.011883	0.000012	0.001535
PRS_aud	171	0.016705	0.016673	0.034133
PRS_aud	172	0.013032	0.009200	0.021607
PRS_aud	173	-0.000296	0.962368	0.962368
PRS_aud	174	0.021542	0.000080	0.001576
PRS_aud	175	-0.020125	0.002029	0.007753
PRS_aud	176	-0.006411	0.175802	0.226158
PRS_aud	177	0.028190	0.000029	0.001535
PRS_aud	178	0.006819	0.081608	0.118703
PRS_aud	179	0.009782	0.168889	0.220590
PRS_aud	180	-0.015341	0.020330	0.038496
PRS_aud	181	0.023457	0.000036	0.001535
PRS_aud	182	-0.008853	0.104684	0.144081
PRS_aud	183	0.014695	0.005848	0.015594
PRS_aud	184	-0.013240	0.001728	0.007497
PRS_aud	185	-0.021310	0.000179	0.002286
PRS_aud	186	0.021338	0.002960	0.010105
PRS_aud	187	-0.010916	0.050237	0.078899
PRS_aud	188	0.016821	0.000032	0.001535
PRS_aud	189	0.008873	0.185503	0.237444
PRS_aud	190	-0.007787	0.173627	0.224488
PRS_aud	191	-0.002344	0.308396	0.363162
PRS_aud	192	-0.005233	0.142842	0.188493
PRS_aud	193	-0.007593	0.073366	0.109195
PRS_aud	194	0.017861	0.003242	0.010922
PRS_aud	195	0.015171	0.018266	0.036249
PRS_aud	196	-0.028710	0.000066	0.001539
PRS_aud	197	0.004169	0.454599	0.503798
PRS_aud	198	0.017073	0.002753	0.009524
PRS_aud	199	0.016171	0.019236	0.037411

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	200	-0.015869	0.023671	0.042977
PRS_aud	201	-0.002367	0.583382	0.632821
PRS_aud	202	0.021875	0.000050	0.001539
PRS_aud	203	-0.022547	0.000032	0.001535
PRS_aud	204	0.002109	0.572585	0.623753
PRS_aud	205	0.021168	0.000870	0.004740
PRS_aud	206	-0.011241	0.047687	0.076299
PRS_aud	207	0.019856	0.001622	0.007416
PRS_aud	208	-0.015406	0.006790	0.017042
PRS_aud	209	-0.024035	0.000013	0.001535
PRS_aud	210	-0.001949	0.719750	0.752065
PRS_aud	211	-0.014933	0.020745	0.038765
PRS_aud	212	0.004514	0.269640	0.325603
PRS_aud	213	0.017415	0.011383	0.025340
PRS_aud	214	-0.022878	0.000155	0.002198
PRS_aud	215	0.014206	0.000600	0.003838
PRS_aud	216	-0.003505	0.249992	0.304752
PRS_aud	217	-0.013941	0.006324	0.016354
PRS_aud	218	-0.004546	0.207257	0.261368
PRS_aud	219	-0.010323	0.022891	0.042270
PRS_aud	220	0.016232	0.015819	0.032925
PRS_aud	221	0.003371	0.362863	0.414700
PRS_aud	222	0.019553	0.005984	0.015792
PRS_aud	223	-0.011007	0.088521	0.126363
PRS_aud	224	-0.019556	0.005771	0.015551
PRS_aud	225	0.023431	0.000056	0.001539
PRS_aud	226	-0.008621	0.071561	0.107132
PRS_aud	227	0.024561	0.000543	0.003838
PRS_aud	228	-0.001065	0.810469	0.833253
PRS_aud	229	0.001182	0.625382	0.665476
PRS_aud	230	-0.010797	0.009395	0.021668
PRS_aud	231	0.016410	0.009127	0.021607
PRS_aud	232	0.016423	0.005321	0.014869
PRS_aud	233	0.022246	0.000187	0.002286
PRS_aud	234	-0.023800	0.001063	0.005443
PRS_aud	235	-0.015330	0.013726	0.029282
PRS_aud	236	-0.018751	0.001716	0.007497
PRS_aud	237	-0.016724	0.000532	0.003838
PRS_aud	238	-0.025324	0.000369	0.003180
PRS_aud	239	-0.019616	0.002691	0.009524
PRS_aud	240	0.026509	0.000204	0.002379
PRS_aud	241	0.014296	0.002131	0.007990
PRS_aud	242	0.011298	0.004647	0.013674

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	243	-0.006782	0.026394	0.047251
PRS_aud	244	0.001209	0.775350	0.800361
PRS_aud	245	0.023107	0.000723	0.004406
PRS_aud	246	0.018166	0.005725	0.015551
PRS_aud	247	-0.006553	0.172028	0.223549
PRS_aud	248	0.002394	0.626483	0.665476
PRS_aud	249	0.014091	0.002153	0.007990
PRS_aud	250	0.000570	0.847816	0.868163
PRS_aud	251	-0.010649	0.039096	0.065415
PRS_aud	252	-0.013861	0.000814	0.004529
PRS_aud	253	-0.013554	0.000575	0.003838
PRS_aud	254	0.010525	0.012118	0.026743
PRS_aud	255	0.022468	0.000526	0.003838
PRS_anx	0	-0.011566	0.050448	0.165573
PRS_anx	1	-0.005372	0.037668	0.148138
PRS_anx	2	0.000220	0.971394	0.975203
PRS_anx	3	-0.010614	0.080554	0.195363
PRS_anx	4	0.002161	0.695573	0.784435
PRS_anx	5	0.000482	0.934999	0.949840
PRS_anx	6	0.000580	0.890558	0.919285
PRS_anx	7	-0.004327	0.362002	0.492939
PRS_anx	8	0.018115	0.005081	0.094305
PRS_anx	9	-0.015170	0.018758	0.108094
PRS_anx	10	-0.005940	0.264193	0.402026
PRS_anx	11	-0.001962	0.419671	0.548142
PRS_anx	12	0.014322	0.011806	0.098681
PRS_anx	13	0.005839	0.343558	0.472854
PRS_anx	14	-0.000772	0.851355	0.908112
PRS_anx	15	0.011330	0.071310	0.191280
PRS_anx	16	0.004759	0.401911	0.530357
PRS_anx	17	0.005055	0.223960	0.362872
PRS_anx	18	0.010238	0.068330	0.191280
PRS_anx	19	0.001752	0.607696	0.716520
PRS_anx	20	0.016910	0.008975	0.094305
PRS_anx	21	-0.014746	0.018141	0.108094
PRS_anx	22	-0.008528	0.064379	0.191280
PRS_anx	23	-0.009609	0.127612	0.251298
PRS_anx	24	0.000541	0.908701	0.930509
PRS_anx	25	0.010686	0.067161	0.191280
PRS_anx	26	0.006762	0.088122	0.201019
PRS_anx	27	-0.008220	0.030287	0.142015
PRS_anx	28	-0.002144	0.737749	0.824732
PRS_anx	29	-0.012364	0.016491	0.105540

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	30	-0.009596	0.130010	0.254065
PRS_anx	31	-0.005689	0.342032	0.472854
PRS_anx	32	0.000687	0.807255	0.877079
PRS_anx	33	0.011650	0.028758	0.138907
PRS_anx	34	-0.007504	0.099513	0.217738
PRS_anx	35	0.011663	0.027495	0.138907
PRS_anx	36	0.007703	0.067438	0.191280
PRS_anx	37	0.011025	0.034650	0.142015
PRS_anx	38	0.013707	0.019001	0.108094
PRS_anx	39	-0.004958	0.326525	0.459288
PRS_anx	40	-0.000028	0.996413	0.996413
PRS_anx	41	-0.008243	0.068803	0.191280
PRS_anx	42	0.017783	0.006625	0.094305
PRS_anx	43	-0.016710	0.001047	0.074566
PRS_anx	44	0.003196	0.483004	0.618246
PRS_anx	45	-0.005063	0.400115	0.530357
PRS_anx	46	-0.003475	0.230032	0.365765
PRS_anx	47	0.010387	0.057438	0.181532
PRS_anx	48	0.015375	0.005039	0.094305
PRS_anx	49	-0.001662	0.647218	0.746342
PRS_anx	50	0.010003	0.008949	0.094305
PRS_anx	51	-0.008096	0.201690	0.339688
PRS_anx	52	-0.012432	0.046148	0.155447
PRS_anx	53	-0.007764	0.144392	0.274112
PRS_anx	54	0.003688	0.360787	0.492939
PRS_anx	55	-0.009391	0.051216	0.165967
PRS_anx	56	0.007903	0.031833	0.142015
PRS_anx	57	-0.015688	0.015571	0.104899
PRS_anx	58	0.008535	0.168149	0.303141
PRS_anx	59	0.002743	0.142781	0.274112
PRS_anx	60	0.006354	0.058170	0.181603
PRS_anx	61	0.002611	0.504343	0.636019
PRS_anx	62	-0.000762	0.836323	0.895811
PRS_anx	63	-0.006466	0.272558	0.402026
PRS_anx	64	-0.007117	0.185336	0.322762
PRS_anx	65	0.009719	0.093216	0.207506
PRS_anx	66	-0.008239	0.139820	0.271166
PRS_anx	67	-0.001085	0.863586	0.911717
PRS_anx	68	0.009109	0.102448	0.220393
PRS_anx	69	-0.001912	0.764109	0.846805
PRS_anx	70	0.003534	0.082947	0.196532
PRS_anx	71	0.015866	0.001165	0.074566
PRS_anx	72	-0.004771	0.034949	0.142015

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	73	-0.005010	0.251866	0.390773
PRS_anx	74	0.002675	0.461725	0.600008
PRS_anx	75	-0.004621	0.070930	0.191280
PRS_anx	76	0.003041	0.572666	0.694799
PRS_anx	77	-0.007495	0.087686	0.201019
PRS_anx	78	-0.006666	0.278803	0.405532
PRS_anx	79	-0.006709	0.264336	0.402026
PRS_anx	80	0.003839	0.314751	0.445172
PRS_anx	81	0.007321	0.103634	0.221085
PRS_anx	82	-0.005617	0.238416	0.376757
PRS_anx	83	-0.012690	0.019637	0.109285
PRS_anx	84	-0.011829	0.001159	0.074566
PRS_anx	85	-0.009398	0.089516	0.201019
PRS_anx	86	-0.010956	0.034925	0.142015
PRS_anx	87	-0.015841	0.014046	0.099882
PRS_anx	88	-0.002620	0.644465	0.746342
PRS_anx	89	-0.001303	0.770493	0.850199
PRS_anx	90	0.002051	0.329233	0.460567
PRS_anx	91	-0.007255	0.101591	0.220393
PRS_anx	92	0.010550	0.012335	0.098681
PRS_anx	93	-0.004533	0.180815	0.317046
PRS_anx	94	0.009459	0.147771	0.278158
PRS_anx	95	0.002816	0.531970	0.657895
PRS_anx	96	0.012688	0.042107	0.149715
PRS_anx	97	0.006688	0.017331	0.108094
PRS_anx	98	-0.006453	0.171610	0.307217
PRS_anx	99	0.005292	0.199037	0.337441
PRS_anx	100	-0.007165	0.197520	0.337101
PRS_anx	101	-0.000662	0.883098	0.919239
PRS_anx	102	-0.006503	0.150200	0.280665
PRS_anx	103	-0.008440	0.046131	0.155447
PRS_anx	104	-0.000614	0.883331	0.919239
PRS_anx	105	-0.006581	0.266597	0.402026
PRS_anx	106	0.007157	0.045075	0.155447
PRS_anx	107	0.005515	0.226396	0.363612
PRS_anx	108	-0.005622	0.162529	0.297196
PRS_anx	109	0.003782	0.164464	0.298600
PRS_anx	110	0.011286	0.028358	0.138907
PRS_anx	111	-0.009964	0.083680	0.196532
PRS_anx	112	-0.003169	0.577349	0.697176
PRS_anx	113	-0.004479	0.364024	0.493070
PRS_anx	114	-0.008423	0.013748	0.099882
PRS_anx	115	0.000711	0.888787	0.919285

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	116	-0.001896	0.747460	0.831955
PRS_anx	117	0.006634	0.068069	0.191280
PRS_anx	118	-0.008397	0.123036	0.246073
PRS_anx	119	0.011096	0.028321	0.138907
PRS_anx	120	-0.004838	0.265319	0.402026
PRS_anx	121	-0.007013	0.079397	0.195363
PRS_anx	122	0.007354	0.113694	0.236632
PRS_anx	123	-0.003329	0.277906	0.405532
PRS_anx	124	0.003300	0.511819	0.642282
PRS_anx	125	0.012979	0.041715	0.149715
PRS_anx	126	0.009683	0.039498	0.148138
PRS_anx	127	-0.004360	0.195137	0.335269
PRS_anx	128	-0.003046	0.604785	0.716520
PRS_anx	129	0.011379	0.038825	0.148138
PRS_anx	130	-0.010303	0.078878	0.195363
PRS_anx	131	0.008612	0.152701	0.283248
PRS_anx	132	-0.002012	0.675325	0.768370
PRS_anx	133	-0.000275	0.868980	0.911717
PRS_anx	134	0.008277	0.119597	0.241077
PRS_anx	135	0.001428	0.802126	0.877079
PRS_anx	136	-0.001893	0.610211	0.716520
PRS_anx	137	0.014635	0.002475	0.079192
PRS_anx	138	-0.010050	0.005983	0.094305
PRS_anx	139	0.005272	0.273252	0.402026
PRS_anx	140	-0.002609	0.529900	0.657895
PRS_anx	141	0.010320	0.033164	0.142015
PRS_anx	142	-0.020508	0.001131	0.074566
PRS_anx	143	0.015619	0.005607	0.094305
PRS_anx	144	-0.009023	0.114949	0.237314
PRS_anx	145	-0.004193	0.389545	0.522113
PRS_anx	146	0.001129	0.659367	0.753563
PRS_anx	147	-0.020067	0.001886	0.079192
PRS_anx	148	0.005782	0.176697	0.311962
PRS_anx	149	0.013270	0.031312	0.142015
PRS_anx	150	-0.015037	0.007004	0.094305
PRS_anx	151	0.000774	0.868219	0.911717
PRS_anx	152	0.009663	0.071730	0.191280
PRS_anx	153	0.001732	0.544272	0.663493
PRS_anx	154	0.016031	0.007779	0.094305
PRS_anx	155	0.009914	0.107548	0.225675
PRS_anx	156	-0.004928	0.082360	0.196532
PRS_anx	157	0.006900	0.076724	0.194837
PRS_anx	158	0.010499	0.033483	0.142015

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	159	-0.007422	0.088748	0.201019
PRS_anx	160	0.014925	0.016426	0.105540
PRS_anx	161	-0.012695	0.009912	0.094305
PRS_anx	162	-0.001325	0.720409	0.808881
PRS_anx	163	-0.003675	0.540451	0.662454
PRS_anx	164	-0.012487	0.038724	0.148138
PRS_anx	165	0.004888	0.076869	0.194837
PRS_anx	166	0.002762	0.227258	0.363612
PRS_anx	167	0.010457	0.066603	0.191280
PRS_anx	168	0.000981	0.811849	0.877079
PRS_anx	169	0.010548	0.027375	0.138907
PRS_anx	170	0.004550	0.062628	0.190520
PRS_anx	171	0.011680	0.063259	0.190520
PRS_anx	172	0.012281	0.006005	0.094305
PRS_anx	173	-0.007541	0.188448	0.325965
PRS_anx	174	0.008701	0.074776	0.194837
PRS_anx	175	-0.014410	0.013355	0.099882
PRS_anx	176	-0.004726	0.267507	0.402026
PRS_anx	177	0.010776	0.074854	0.194837
PRS_anx	178	0.005675	0.107123	0.225675
PRS_anx	179	-0.001405	0.826448	0.888953
PRS_anx	180	-0.015921	0.006723	0.094305
PRS_anx	181	0.008801	0.080654	0.195363
PRS_anx	182	-0.003032	0.540831	0.662454
PRS_anx	183	0.005144	0.286107	0.413805
PRS_anx	184	-0.004716	0.211916	0.345544
PRS_anx	185	-0.005134	0.304154	0.432574
PRS_anx	186	0.013599	0.034518	0.142015
PRS_anx	187	-0.011491	0.020973	0.114238
PRS_anx	188	0.003805	0.297894	0.426910
PRS_anx	189	0.016049	0.008010	0.094305
PRS_anx	190	0.003755	0.470544	0.608380
PRS_anx	191	-0.003299	0.117159	0.239941
PRS_anx	192	0.000892	0.782465	0.859704
PRS_anx	193	-0.011596	0.002229	0.079192
PRS_anx	194	0.008379	0.125317	0.248692
PRS_anx	195	0.014696	0.010051	0.094305
PRS_anx	196	-0.004159	0.530360	0.657895
PRS_anx	197	-0.000269	0.957051	0.964587
PRS_anx	198	0.013319	0.008600	0.094305
PRS_anx	199	0.013027	0.034251	0.142015
PRS_anx	200	-0.007529	0.242603	0.378698
PRS_anx	201	0.010449	0.006936	0.094305

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	202	0.009538	0.047525	0.158004
PRS_anx	203	-0.004110	0.401242	0.530357
PRS_anx	204	-0.005388	0.118253	0.240260
PRS_anx	205	0.007204	0.210914	0.345544
PRS_anx	206	-0.010374	0.039928	0.148138
PRS_anx	207	0.012417	0.027000	0.138907
PRS_anx	208	-0.005773	0.272644	0.402026
PRS_anx	209	-0.012543	0.010671	0.094305
PRS_anx	210	0.009910	0.045849	0.155447
PRS_anx	211	-0.014443	0.012226	0.098681
PRS_anx	212	-0.006350	0.088334	0.201019
PRS_anx	213	0.000637	0.919005	0.937312
PRS_anx	214	-0.013212	0.013736	0.099882
PRS_anx	215	0.011468	0.002151	0.079192
PRS_anx	216	0.001541	0.582031	0.699530
PRS_anx	217	-0.005130	0.270684	0.402026
PRS_anx	218	-0.007748	0.018658	0.108094
PRS_anx	219	0.000536	0.896457	0.921659
PRS_anx	220	0.002455	0.685872	0.776917
PRS_anx	221	-0.000593	0.861616	0.911717
PRS_anx	222	0.016225	0.009936	0.094305
PRS_anx	223	-0.006784	0.241168	0.378698
PRS_anx	224	-0.009257	0.144551	0.274112
PRS_anx	225	0.006559	0.210844	0.345544
PRS_anx	226	-0.007489	0.080892	0.195363
PRS_anx	227	0.010706	0.094416	0.208366
PRS_anx	228	-0.003505	0.385310	0.519154
PRS_anx	229	0.001135	0.612961	0.716520
PRS_anx	230	-0.002029	0.591787	0.707933
PRS_anx	231	0.007128	0.209909	0.345544
PRS_anx	232	0.002376	0.658186	0.753563
PRS_anx	233	0.011078	0.039057	0.148138
PRS_anx	234	-0.006828	0.298503	0.426910
PRS_anx	235	0.002737	0.631678	0.735044
PRS_anx	236	-0.010174	0.055665	0.178129
PRS_anx	237	-0.002341	0.602742	0.716520
PRS_anx	238	-0.012058	0.058934	0.181772
PRS_anx	239	-0.010333	0.076603	0.194837
PRS_anx	240	0.013065	0.041285	0.149715
PRS_anx	241	-0.002877	0.502479	0.636019
PRS_anx	242	0.000876	0.811983	0.877079
PRS_anx	243	-0.006495	0.015473	0.104899
PRS_anx	244	0.003701	0.337028	0.468908

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	245	0.016060	0.008340	0.094305
PRS_anx	246	0.008461	0.153795	0.283248
PRS_anx	247	-0.007720	0.070447	0.191280
PRS_anx	248	0.000284	0.948989	0.960241
PRS_anx	249	0.005239	0.210470	0.345544
PRS_anx	250	0.001875	0.488630	0.622335
PRS_anx	251	-0.003367	0.475746	0.612015
PRS_anx	252	-0.005068	0.173525	0.308489
PRS_anx	253	-0.008988	0.009917	0.094305
PRS_anx	254	0.003217	0.406341	0.533453
PRS_anx	255	0.014907	0.010683	0.094305
PRS_mdd	0	-0.032012	0.000000	0.000001
PRS_mdd	1	-0.007756	0.002953	0.004784
PRS_mdd	2	0.021547	0.000353	0.000766
PRS_mdd	3	-0.020449	0.000738	0.001411
PRS_mdd	4	0.021189	0.000110	0.000273
PRS_mdd	5	-0.018593	0.001680	0.002886
PRS_mdd	6	0.010450	0.013363	0.019775
PRS_mdd	7	-0.000022	0.996201	0.996201
PRS_mdd	8	0.037261	0.000000	0.000000
PRS_mdd	9	-0.033814	0.000000	0.000002
PRS_mdd	10	-0.013353	0.011371	0.016924
PRS_mdd	11	-0.001801	0.459871	0.488494
PRS_mdd	12	0.026764	0.000003	0.000015
PRS_mdd	13	0.027925	0.000004	0.000017
PRS_mdd	14	0.008949	0.029432	0.039865
PRS_mdd	15	0.026243	0.000034	0.000099
PRS_mdd	16	-0.011490	0.044029	0.057216
PRS_mdd	17	0.013857	0.000797	0.001501
PRS_mdd	18	0.022453	0.000048	0.000134
PRS_mdd	19	0.012519	0.000278	0.000613
PRS_mdd	20	0.027278	0.000025	0.000078
PRS_mdd	21	-0.026828	0.000021	0.000068
PRS_mdd	22	-0.025722	0.000000	0.000000
PRS_mdd	23	-0.027235	0.000015	0.000054
PRS_mdd	24	-0.007519	0.109707	0.134378
PRS_mdd	25	0.028376	0.000001	0.000007
PRS_mdd	26	0.012744	0.001390	0.002472
PRS_mdd	27	-0.013066	0.000683	0.001335
PRS_mdd	28	-0.020888	0.001318	0.002360
PRS_mdd	29	-0.005887	0.256801	0.300187
PRS_mdd	30	-0.020487	0.001237	0.002229
PRS_mdd	31	-0.020002	0.000804	0.001503

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	32	-0.005870	0.040356	0.052980
PRS_mdd	33	0.025010	0.000002	0.000012
PRS_mdd	34	-0.006531	0.152265	0.185618
PRS_mdd	35	0.020146	0.000159	0.000370
PRS_mdd	36	0.013289	0.001829	0.003122
PRS_mdd	37	0.020297	0.000118	0.000284
PRS_mdd	38	0.017660	0.002759	0.004527
PRS_mdd	39	-0.000215	0.966115	0.969904
PRS_mdd	40	-0.012976	0.037417	0.049630
PRS_mdd	41	-0.004645	0.314134	0.349645
PRS_mdd	42	0.025697	0.000093	0.000238
PRS_mdd	43	-0.030165	0.000000	0.000000
PRS_mdd	44	-0.015526	0.000501	0.001026
PRS_mdd	45	-0.027182	0.000006	0.000025
PRS_mdd	46	-0.002239	0.440222	0.473516
PRS_mdd	47	0.029888	0.000000	0.000001
PRS_mdd	48	0.026891	0.000001	0.000007
PRS_mdd	49	-0.002830	0.431203	0.465772
PRS_mdd	50	0.016616	0.000020	0.000066
PRS_mdd	51	-0.023718	0.000193	0.000438
PRS_mdd	52	-0.029246	0.000002	0.000012
PRS_mdd	53	-0.009168	0.084697	0.106810
PRS_mdd	54	0.013943	0.000486	0.001020
PRS_mdd	55	-0.016473	0.000641	0.001268
PRS_mdd	56	0.015897	0.000021	0.000069
PRS_mdd	57	-0.024585	0.000172	0.000393
PRS_mdd	58	0.021370	0.000597	0.001203
PRS_mdd	59	0.004171	0.026501	0.036280
PRS_mdd	60	0.008722	0.009937	0.015053
PRS_mdd	61	-0.008866	0.023916	0.033312
PRS_mdd	62	-0.009015	0.013541	0.019816
PRS_mdd	63	-0.022617	0.000121	0.000290
PRS_mdd	64	-0.011908	0.027624	0.037616
PRS_mdd	65	0.012371	0.035535	0.047380
PRS_mdd	66	-0.012539	0.026130	0.035964
PRS_mdd	67	-0.024459	0.000075	0.000199
PRS_mdd	68	0.015585	0.005006	0.007861
PRS_mdd	69	-0.007199	0.262243	0.302407
PRS_mdd	70	0.009603	0.000003	0.000015
PRS_mdd	71	0.009258	0.057949	0.074174
PRS_mdd	72	-0.007750	0.000739	0.001411
PRS_mdd	73	-0.018588	0.000014	0.000050
PRS_mdd	74	0.013859	0.000128	0.000304

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	75	-0.014558	0.000000	0.000000
PRS_mdd	76	0.013441	0.011293	0.016907
PRS_mdd	77	-0.005571	0.207659	0.247260
PRS_mdd	78	-0.025475	0.000032	0.000096
PRS_mdd	79	-0.032311	0.000000	0.000001
PRS_mdd	80	-0.002614	0.488461	0.516719
PRS_mdd	81	0.017571	0.000104	0.000262
PRS_mdd	82	-0.022659	0.000001	0.000007
PRS_mdd	83	-0.032468	0.000000	0.000000
PRS_mdd	84	-0.011545	0.001614	0.002811
PRS_mdd	85	-0.020126	0.000418	0.000893
PRS_mdd	86	-0.021339	0.000046	0.000130
PRS_mdd	87	-0.032364	0.000001	0.000005
PRS_mdd	88	0.014928	0.007159	0.010974
PRS_mdd	89	0.003612	0.418951	0.454456
PRS_mdd	90	0.005957	0.004556	0.007245
PRS_mdd	91	-0.021449	0.000001	0.000007
PRS_mdd	92	0.004752	0.259856	0.301262
PRS_mdd	93	-0.004346	0.201097	0.241695
PRS_mdd	94	0.028413	0.000015	0.000053
PRS_mdd	95	-0.014801	0.000829	0.001538
PRS_mdd	96	0.033799	0.000000	0.000001
PRS_mdd	97	0.007850	0.005359	0.008366
PRS_mdd	98	0.004570	0.329051	0.363091
PRS_mdd	99	0.003099	0.448433	0.478328
PRS_mdd	100	-0.025244	0.000004	0.000018
PRS_mdd	101	-0.014997	0.000738	0.001411
PRS_mdd	102	-0.020945	0.000002	0.000012
PRS_mdd	103	-0.013262	0.001860	0.003153
PRS_mdd	104	0.014212	0.000588	0.001195
PRS_mdd	105	-0.028929	0.000001	0.000005
PRS_mdd	106	0.012938	0.000407	0.000875
PRS_mdd	107	0.012547	0.006163	0.009504
PRS_mdd	108	0.003567	0.371915	0.405150
PRS_mdd	109	0.003566	0.192436	0.232375
PRS_mdd	110	0.016630	0.001428	0.002521
PRS_mdd	111	-0.009683	0.095914	0.119194
PRS_mdd	112	0.006243	0.279386	0.317879
PRS_mdd	113	0.008089	0.094505	0.118016
PRS_mdd	114	-0.008316	0.014236	0.020474
PRS_mdd	115	0.020493	0.000037	0.000108
PRS_mdd	116	-0.025043	0.000016	0.000056
PRS_mdd	117	0.020129	0.000000	0.000001

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	118	-0.029380	0.000000	0.000001
PRS_mdd	119	0.024554	0.000001	0.000007
PRS_mdd	120	-0.018478	0.000023	0.000075
PRS_mdd	121	0.004370	0.267781	0.307408
PRS_mdd	122	0.006322	0.182754	0.221730
PRS_mdd	123	-0.001394	0.648078	0.668984
PRS_mdd	124	0.023966	0.000001	0.000007
PRS_mdd	125	0.016611	0.009844	0.015001
PRS_mdd	126	0.010194	0.030900	0.041416
PRS_mdd	127	-0.010500	0.002225	0.003743
PRS_mdd	128	0.006021	0.306031	0.342113
PRS_mdd	129	0.022007	0.000076	0.000199
PRS_mdd	130	-0.014346	0.013984	0.020225
PRS_mdd	131	0.025835	0.000019	0.000064
PRS_mdd	132	-0.007618	0.104576	0.128709
PRS_mdd	133	0.002834	0.088574	0.111152
PRS_mdd	134	0.027311	0.000000	0.000002
PRS_mdd	135	-0.015919	0.004541	0.007245
PRS_mdd	136	-0.004409	0.229467	0.270707
PRS_mdd	137	0.016538	0.000644	0.001268
PRS_mdd	138	-0.019278	0.000000	0.000001
PRS_mdd	139	0.010963	0.024063	0.033312
PRS_mdd	140	-0.015327	0.000231	0.000514
PRS_mdd	141	0.010530	0.030869	0.041416
PRS_mdd	142	-0.026071	0.000040	0.000114
PRS_mdd	143	0.013518	0.017572	0.024991
PRS_mdd	144	-0.005485	0.351429	0.384469
PRS_mdd	145	0.002712	0.580231	0.603818
PRS_mdd	146	-0.002685	0.294972	0.334128
PRS_mdd	147	-0.025750	0.000076	0.000199
PRS_mdd	148	0.026914	0.000000	0.000000
PRS_mdd	149	-0.002988	0.622295	0.644970
PRS_mdd	150	-0.024433	0.000019	0.000065
PRS_mdd	151	0.005408	0.251580	0.295433
PRS_mdd	152	0.013129	0.013624	0.019816
PRS_mdd	153	0.008358	0.002942	0.004784
PRS_mdd	154	0.034901	0.000000	0.000000
PRS_mdd	155	0.023862	0.000111	0.000273
PRS_mdd	156	-0.009981	0.000499	0.001026
PRS_mdd	157	0.007624	0.051621	0.066406
PRS_mdd	158	0.020153	0.000050	0.000137
PRS_mdd	159	-0.002695	0.536881	0.563285
PRS_mdd	160	0.018985	0.002675	0.004447

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	161	-0.024655	0.000001	0.000005
PRS_mdd	162	0.013988	0.000112	0.000273
PRS_mdd	163	-0.023707	0.000060	0.000163
PRS_mdd	164	0.004548	0.442906	0.474410
PRS_mdd	165	0.013544	0.000001	0.000007
PRS_mdd	166	0.002565	0.260074	0.301262
PRS_mdd	167	0.010333	0.071937	0.091168
PRS_mdd	168	-0.012855	0.001519	0.002663
PRS_mdd	169	0.021685	0.000007	0.000027
PRS_mdd	170	0.014212	0.000000	0.000000
PRS_mdd	171	0.027877	0.000010	0.000036
PRS_mdd	172	0.011691	0.010093	0.015198
PRS_mdd	173	0.000247	0.965324	0.969904
PRS_mdd	174	0.025123	0.000000	0.000003
PRS_mdd	175	-0.028787	0.000001	0.000006
PRS_mdd	176	-0.000676	0.874635	0.895627
PRS_mdd	177	0.029241	0.000001	0.000007
PRS_mdd	178	0.008145	0.021026	0.029738
PRS_mdd	179	0.013335	0.038542	0.050860
PRS_mdd	180	-0.027353	0.000005	0.000022
PRS_mdd	181	0.027770	0.000000	0.000001
PRS_mdd	182	-0.011809	0.016177	0.023136
PRS_mdd	183	0.019019	0.000069	0.000185
PRS_mdd	184	-0.015753	0.000031	0.000095
PRS_mdd	185	-0.020739	0.000042	0.000119
PRS_mdd	186	0.030033	0.000004	0.000017
PRS_mdd	187	-0.020891	0.000029	0.000091
PRS_mdd	188	0.018063	0.000001	0.000005
PRS_mdd	189	0.011285	0.063258	0.080567
PRS_mdd	190	-0.015631	0.002709	0.004475
PRS_mdd	191	-0.004115	0.048186	0.062301
PRS_mdd	192	-0.005292	0.103690	0.128234
PRS_mdd	193	-0.008606	0.024073	0.033312
PRS_mdd	194	0.023794	0.000014	0.000050
PRS_mdd	195	0.021689	0.000164	0.000378
PRS_mdd	196	-0.033877	0.000000	0.000002
PRS_mdd	197	0.005185	0.298559	0.336701
PRS_mdd	198	0.022957	0.000008	0.000030
PRS_mdd	199	0.021032	0.000756	0.001434
PRS_mdd	200	-0.024517	0.000103	0.000261
PRS_mdd	201	0.000225	0.954055	0.965368
PRS_mdd	202	0.029982	0.000000	0.000000
PRS_mdd	203	-0.022087	0.000007	0.000027

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	204	0.000477	0.888314	0.906010
PRS_mdd	205	0.025584	0.000009	0.000033
PRS_mdd	206	-0.012703	0.013608	0.019816
PRS_mdd	207	0.026138	0.000004	0.000017
PRS_mdd	208	-0.017911	0.000483	0.001020
PRS_mdd	209	-0.027170	0.000000	0.000001
PRS_mdd	210	-0.001427	0.773434	0.795177
PRS_mdd	211	-0.019641	0.000839	0.001545
PRS_mdd	212	0.002353	0.523018	0.550998
PRS_mdd	213	0.019096	0.002237	0.003743
PRS_mdd	214	-0.027117	0.000001	0.000005
PRS_mdd	215	0.019909	0.000000	0.000001
PRS_mdd	216	-0.002658	0.342926	0.376777
PRS_mdd	217	-0.014900	0.001123	0.002054
PRS_mdd	218	-0.004198	0.204100	0.244157
PRS_mdd	219	-0.008415	0.041436	0.054120
PRS_mdd	220	0.026376	0.000014	0.000050
PRS_mdd	221	-0.004109	0.219459	0.260100
PRS_mdd	222	0.022858	0.000349	0.000763
PRS_mdd	223	-0.016422	0.004865	0.007687
PRS_mdd	224	-0.026746	0.000028	0.000089
PRS_mdd	225	0.029160	0.000000	0.000001
PRS_mdd	226	-0.009881	0.021988	0.030928
PRS_mdd	227	0.031115	0.000001	0.000007
PRS_mdd	228	0.000408	0.919805	0.934405
PRS_mdd	229	0.002186	0.316422	0.350667
PRS_mdd	230	-0.012049	0.001213	0.002201
PRS_mdd	231	0.023397	0.000033	0.000097
PRS_mdd	232	0.019802	0.000209	0.000469
PRS_mdd	233	0.028490	0.000000	0.000001
PRS_mdd	234	-0.030946	0.000003	0.000013
PRS_mdd	235	-0.019031	0.000603	0.001207
PRS_mdd	236	-0.028127	0.000000	0.000001
PRS_mdd	237	-0.019836	0.000005	0.000022
PRS_mdd	238	-0.033588	0.000000	0.000001
PRS_mdd	239	-0.026867	0.000005	0.000020
PRS_mdd	240	0.029693	0.000004	0.000017
PRS_mdd	241	0.014691	0.000499	0.001026
PRS_mdd	242	0.014199	0.000093	0.000238
PRS_mdd	243	-0.010195	0.000156	0.000366
PRS_mdd	244	0.002308	0.549804	0.574489
PRS_mdd	245	0.031379	0.000000	0.000003
PRS_mdd	246	0.026010	0.000011	0.000040

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	247	-0.012543	0.003806	0.006128
PRS_mdd	248	0.004817	0.279050	0.317879
PRS_mdd	249	0.019264	0.000003	0.000016
PRS_mdd	250	0.002798	0.303969	0.341299
PRS_mdd	251	-0.012975	0.005564	0.008632
PRS_mdd	252	-0.018968	0.000000	0.000002
PRS_mdd	253	-0.018970	0.000000	0.000001
PRS_mdd	254	0.012078	0.001626	0.002812
PRS_mdd	255	0.029026	0.000001	0.000005

3.4.3 Without Symptoms

Table 16: Associations between polygenic risk scores (PRS) and brain normative deviations across embedding dimensions, without correction for clinical symptom severity. "Dim" indicates the latent embedding dimension tested, and β_{PRS} is the regression coefficient for the PRS–deviation association. p-values are reported both uncorrected and after Benjamini–Hochberg false discovery rate (FDR) adjustment (p_{FDR}).

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	0	-0.026279	0.000079	0.000914
PRS_aud	1	-0.008863	0.001717	0.006280
PRS_aud	2	0.019177	0.003905	0.010306
PRS_aud	3	-0.019896	0.003138	0.009027
PRS_aud	4	0.013353	0.029093	0.048679
PRS_aud	5	-0.007361	0.265840	0.318014
PRS_aud	6	0.007355	0.114787	0.153049
PRS_aud	7	-0.003485	0.508598	0.558165
PRS_aud	8	0.026060	0.000339	0.001973
PRS_aud	9	-0.026723	0.000246	0.001777
PRS_aud	10	-0.015865	0.007680	0.016950
PRS_aud	11	-0.001889	0.478435	0.530214
PRS_aud	12	0.023175	0.000280	0.001822
PRS_aud	13	0.025556	0.000153	0.001453
PRS_aud	14	0.004815	0.294109	0.345376
PRS_aud	15	0.020345	0.003738	0.010100
PRS_aud	16	-0.010582	0.091047	0.127367
PRS_aud	17	0.012004	0.008097	0.017717
PRS_aud	18	0.018699	0.002258	0.007048
PRS_aud	19	0.015606	0.000033	0.000645
PRS_aud	20	0.016852	0.020292	0.036074
PRS_aud	21	-0.020548	0.003337	0.009389

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	22	-0.021428	0.000031	0.000645
PRS_aud	23	-0.028057	0.000063	0.000902
PRS_aud	24	-0.006824	0.184708	0.232933
PRS_aud	25	0.022215	0.000580	0.002853
PRS_aud	26	0.008530	0.052518	0.080507
PRS_aud	27	-0.012810	0.002818	0.008388
PRS_aud	28	-0.011401	0.112281	0.150644
PRS_aud	29	-0.011141	0.051934	0.080090
PRS_aud	30	-0.019425	0.005975	0.014033
PRS_aud	31	-0.016965	0.010144	0.021462
PRS_aud	32	-0.004688	0.134299	0.173640
PRS_aud	33	0.015345	0.009190	0.019769
PRS_aud	34	-0.006228	0.220686	0.271614
PRS_aud	35	0.018518	0.001838	0.006308
PRS_aud	36	0.007713	0.099489	0.136825
PRS_aud	37	0.017017	0.003867	0.010306
PRS_aud	38	0.014062	0.031637	0.052591
PRS_aud	39	0.000082	0.988168	0.988168
PRS_aud	40	-0.011799	0.088008	0.125168
PRS_aud	41	-0.008591	0.089242	0.125527
PRS_aud	42	0.020686	0.005132	0.012755
PRS_aud	43	-0.022530	0.000096	0.001028
PRS_aud	44	-0.013427	0.006179	0.014380
PRS_aud	45	-0.019481	0.003575	0.009843
PRS_aud	46	-0.001881	0.547665	0.594077
PRS_aud	47	0.019284	0.001593	0.005909
PRS_aud	48	0.019094	0.001897	0.006308
PRS_aud	49	-0.006065	0.129488	0.169995
PRS_aud	50	0.011040	0.009787	0.020880
PRS_aud	51	-0.021571	0.002386	0.007271
PRS_aud	52	-0.024289	0.000461	0.002512
PRS_aud	53	-0.009389	0.112394	0.150644
PRS_aud	54	0.009491	0.033432	0.054864
PRS_aud	55	-0.013446	0.012317	0.024920
PRS_aud	56	0.014187	0.000562	0.002853
PRS_aud	57	-0.023023	0.001576	0.005909
PRS_aud	58	0.020012	0.004319	0.011281
PRS_aud	59	0.003935	0.059396	0.089388
PRS_aud	60	0.007831	0.037151	0.060194
PRS_aud	61	-0.008054	0.062194	0.092568
PRS_aud	62	-0.007969	0.045520	0.071933
PRS_aud	63	-0.015574	0.017994	0.032903
PRS_aud	64	-0.008954	0.136305	0.175347

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	65	0.006986	0.285977	0.338935
PRS_aud	66	-0.015440	0.013289	0.025579
PRS_aud	67	-0.025170	0.000229	0.001724
PRS_aud	68	0.014314	0.020954	0.036994
PRS_aud	69	0.003927	0.582444	0.629137
PRS_aud	70	0.008312	0.000264	0.001779
PRS_aud	71	0.003543	0.517225	0.563446
PRS_aud	72	-0.006167	0.013483	0.025759
PRS_aud	73	-0.015249	0.001211	0.005257
PRS_aud	74	0.007600	0.059708	0.089388
PRS_aud	75	-0.010954	0.000121	0.001190
PRS_aud	76	0.014724	0.012728	0.024920
PRS_aud	77	-0.000276	0.954996	0.962516
PRS_aud	78	-0.020330	0.002903	0.008542
PRS_aud	79	-0.024088	0.000299	0.001822
PRS_aud	80	-0.006457	0.120006	0.159179
PRS_aud	81	0.013989	0.005246	0.012913
PRS_aud	82	-0.015229	0.002948	0.008577
PRS_aud	83	-0.025889	0.000023	0.000595
PRS_aud	84	-0.008589	0.033862	0.055214
PRS_aud	85	-0.010889	0.078871	0.114721
PRS_aud	86	-0.014501	0.012792	0.024920
PRS_aud	87	-0.022311	0.001780	0.006308
PRS_aud	88	0.019914	0.001304	0.005380
PRS_aud	89	-0.008540	0.082703	0.118589
PRS_aud	90	0.005811	0.012849	0.024920
PRS_aud	91	-0.015538	0.001804	0.006308
PRS_aud	92	0.002469	0.597509	0.642698
PRS_aud	93	-0.002828	0.451205	0.504403
PRS_aud	94	0.019642	0.007304	0.016259
PRS_aud	95	-0.010698	0.029086	0.048679
PRS_aud	96	0.025803	0.000222	0.001723
PRS_aud	97	0.004708	0.130960	0.171049
PRS_aud	98	0.000103	0.984214	0.988074
PRS_aud	99	-0.001012	0.822502	0.852471
PRS_aud	100	-0.020378	0.000864	0.003949
PRS_aud	101	-0.009584	0.053936	0.082188
PRS_aud	102	-0.019600	0.000075	0.000914
PRS_aud	103	-0.010026	0.032940	0.054405
PRS_aud	104	0.007792	0.088727	0.125492
PRS_aud	105	-0.028171	0.000018	0.000498
PRS_aud	106	0.011129	0.005852	0.014033
PRS_aud	107	0.010442	0.039376	0.063372

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	108	0.000535	0.904215	0.914937
PRS_aud	109	0.000419	0.888326	0.906022
PRS_aud	110	0.014431	0.012568	0.024920
PRS_aud	111	-0.005451	0.399166	0.450160
PRS_aud	112	0.003226	0.612990	0.653856
PRS_aud	113	0.009443	0.079901	0.115563
PRS_aud	114	-0.004383	0.241361	0.292836
PRS_aud	115	0.017403	0.001801	0.006308
PRS_aud	116	-0.023705	0.000219	0.001723
PRS_aud	117	0.015200	0.000173	0.001531
PRS_aud	118	-0.020063	0.001003	0.004504
PRS_aud	119	0.020452	0.000292	0.001822
PRS_aud	120	-0.015012	0.002043	0.006538
PRS_aud	121	0.007489	0.082920	0.118589
PRS_aud	122	0.004401	0.393146	0.445334
PRS_aud	123	0.002228	0.510198	0.558165
PRS_aud	124	0.017423	0.001446	0.005607
PRS_aud	125	0.010762	0.133558	0.173558
PRS_aud	126	0.005313	0.310229	0.362642
PRS_aud	127	-0.008448	0.024327	0.042078
PRS_aud	128	0.009480	0.145154	0.185797
PRS_aud	129	0.014506	0.019490	0.034892
PRS_aud	130	-0.016257	0.012512	0.024920
PRS_aud	131	0.022726	0.000737	0.003496
PRS_aud	132	-0.004948	0.345672	0.396826
PRS_aud	133	0.000914	0.617352	0.655776
PRS_aud	134	0.018939	0.001320	0.005380
PRS_aud	135	-0.013930	0.025199	0.043006
PRS_aud	136	-0.008147	0.047442	0.074510
PRS_aud	137	0.004980	0.359161	0.410470
PRS_aud	138	-0.016350	0.000070	0.000914
PRS_aud	139	0.008999	0.095547	0.132217
PRS_aud	140	-0.011860	0.010687	0.022244
PRS_aud	141	0.010288	0.057484	0.087076
PRS_aud	142	-0.019245	0.006733	0.015120
PRS_aud	143	0.014044	0.026382	0.044726
PRS_aud	144	-0.015282	0.019121	0.034471
PRS_aud	145	0.001596	0.767157	0.798343
PRS_aud	146	0.001061	0.708111	0.745993
PRS_aud	147	-0.014345	0.048550	0.075786
PRS_aud	148	0.018819	0.000078	0.000914
PRS_aud	149	-0.005614	0.403983	0.453595
PRS_aud	150	-0.020268	0.001292	0.005380

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	151	0.007130	0.167849	0.213778
PRS_aud	152	0.005516	0.361086	0.410836
PRS_aud	153	0.007102	0.022291	0.038971
PRS_aud	154	0.027285	0.000058	0.000902
PRS_aud	155	0.019968	0.003576	0.009843
PRS_aud	156	-0.003810	0.223871	0.274215
PRS_aud	157	0.010625	0.013720	0.026018
PRS_aud	158	0.017814	0.001324	0.005380
PRS_aud	159	-0.005507	0.257618	0.309626
PRS_aud	160	0.015623	0.024665	0.042378
PRS_aud	161	-0.017167	0.001994	0.006461
PRS_aud	162	0.010619	0.008744	0.018970
PRS_aud	163	-0.020945	0.001348	0.005392
PRS_aud	164	0.008227	0.211729	0.261849
PRS_aud	165	0.011478	0.000198	0.001636
PRS_aud	166	0.001768	0.483223	0.533211
PRS_aud	167	0.006416	0.313066	0.364295
PRS_aud	168	-0.006900	0.125191	0.165201
PRS_aud	169	0.019719	0.000250	0.001777
PRS_aud	170	0.012524	0.000004	0.000377
PRS_aud	171	0.016744	0.016617	0.030827
PRS_aud	172	0.014245	0.004424	0.011440
PRS_aud	173	0.000903	0.885637	0.906022
PRS_aud	174	0.023632	0.000015	0.000498
PRS_aud	175	-0.021153	0.001197	0.005257
PRS_aud	176	-0.007993	0.091947	0.127927
PRS_aud	177	0.030537	0.000006	0.000377
PRS_aud	178	0.006459	0.099946	0.136825
PRS_aud	179	0.008472	0.234792	0.286223
PRS_aud	180	-0.016632	0.011988	0.024552
PRS_aud	181	0.025464	0.000007	0.000377
PRS_aud	182	-0.009812	0.072652	0.106279
PRS_aud	183	0.014853	0.005463	0.013318
PRS_aud	184	-0.014627	0.000548	0.002853
PRS_aud	185	-0.023087	0.000050	0.000855
PRS_aud	186	0.022030	0.002181	0.006893
PRS_aud	187	-0.010956	0.049787	0.077245
PRS_aud	188	0.017756	0.000012	0.000492
PRS_aud	189	0.006720	0.316457	0.366575
PRS_aud	190	-0.007300	0.202982	0.252249
PRS_aud	191	-0.002493	0.278780	0.331943
PRS_aud	192	-0.005696	0.111398	0.150644
PRS_aud	193	-0.007870	0.063817	0.094434

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	194	0.018891	0.001890	0.006308
PRS_aud	195	0.015784	0.014262	0.026735
PRS_aud	196	-0.029783	0.000036	0.000653
PRS_aud	197	0.005912	0.289986	0.342103
PRS_aud	198	0.017385	0.002343	0.007225
PRS_aud	199	0.016223	0.019054	0.034471
PRS_aud	200	-0.016038	0.022378	0.038971
PRS_aud	201	-0.001548	0.719944	0.752268
PRS_aud	202	0.023302	0.000016	0.000498
PRS_aud	203	-0.024693	0.000005	0.000377
PRS_aud	204	0.001911	0.609300	0.652639
PRS_aud	205	0.021944	0.000573	0.002853
PRS_aud	206	-0.011700	0.039607	0.063372
PRS_aud	207	0.021056	0.000845	0.003934
PRS_aud	208	-0.015584	0.006267	0.014454
PRS_aud	209	-0.025471	0.000004	0.000377
PRS_aud	210	-0.001973	0.716730	0.751979
PRS_aud	211	-0.016086	0.012811	0.024920
PRS_aud	212	0.005270	0.198280	0.247608
PRS_aud	213	0.019562	0.004479	0.011467
PRS_aud	214	-0.024223	0.000063	0.000902
PRS_aud	215	0.015563	0.000173	0.001531
PRS_aud	216	-0.003497	0.251935	0.304223
PRS_aud	217	-0.015011	0.003316	0.009389
PRS_aud	218	-0.004813	0.181932	0.230567
PRS_aud	219	-0.012363	0.006499	0.014748
PRS_aud	220	0.015989	0.017689	0.032579
PRS_aud	221	0.003645	0.326449	0.376445
PRS_aud	222	0.021339	0.002729	0.008218
PRS_aud	223	-0.010508	0.104928	0.142880
PRS_aud	224	-0.019875	0.005110	0.012755
PRS_aud	225	0.024433	0.000027	0.000627
PRS_aud	226	-0.008769	0.067569	0.099411
PRS_aud	227	0.025431	0.000349	0.001988
PRS_aud	228	-0.000540	0.903203	0.914937
PRS_aud	229	0.001130	0.641106	0.678195
PRS_aud	230	-0.010678	0.010423	0.021870
PRS_aud	231	0.015988	0.011275	0.023278
PRS_aud	232	0.016531	0.005105	0.012755
PRS_aud	233	0.023168	0.000103	0.001053
PRS_aud	234	-0.024943	0.000609	0.002941
PRS_aud	235	-0.017150	0.005884	0.014033
PRS_aud	236	-0.018944	0.001566	0.005909

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_aud	237	-0.017650	0.000259	0.001779
PRS_aud	238	-0.026587	0.000188	0.001600
PRS_aud	239	-0.020271	0.001965	0.006449
PRS_aud	240	0.027998	0.000089	0.000993
PRS_aud	241	0.014904	0.001389	0.005472
PRS_aud	242	0.011584	0.003748	0.010100
PRS_aud	243	-0.007489	0.014308	0.026735
PRS_aud	244	0.000780	0.854358	0.878376
PRS_aud	245	0.023703	0.000536	0.002853
PRS_aud	246	0.018127	0.005941	0.014033
PRS_aud	247	-0.006241	0.193590	0.242936
PRS_aud	248	0.003579	0.467803	0.520685
PRS_aud	249	0.014306	0.001878	0.006308
PRS_aud	250	0.000642	0.828924	0.855664
PRS_aud	251	-0.010410	0.044076	0.070084
PRS_aud	252	-0.014551	0.000452	0.002512
PRS_aud	253	-0.014285	0.000289	0.001822
PRS_aud	254	0.011419	0.006510	0.014748
PRS_aud	255	0.023259	0.000339	0.001973
PRS_anx	0	-0.011600	0.049898	0.163769
PRS_anx	1	-0.005314	0.040108	0.144869
PRS_anx	2	0.000239	0.968941	0.972693
PRS_anx	3	-0.010622	0.080748	0.189413
PRS_anx	4	0.002266	0.681653	0.772138
PRS_anx	5	0.000342	0.953944	0.963851
PRS_anx	6	0.000569	0.892684	0.917779
PRS_anx	7	-0.004462	0.347788	0.473584
PRS_anx	8	0.018285	0.004737	0.089687
PRS_anx	9	-0.015267	0.018130	0.104523
PRS_anx	10	-0.005903	0.267427	0.392453
PRS_anx	11	-0.002051	0.399983	0.527812
PRS_anx	12	0.014474	0.011065	0.093002
PRS_anx	13	0.005820	0.345435	0.472895
PRS_anx	14	-0.000657	0.873428	0.911439
PRS_anx	15	0.011643	0.064244	0.183539
PRS_anx	16	0.004745	0.403614	0.529873
PRS_anx	17	0.005090	0.221381	0.352009
PRS_anx	18	0.010288	0.067242	0.185748
PRS_anx	19	0.001630	0.633561	0.733898
PRS_anx	20	0.017187	0.007985	0.089687
PRS_anx	21	-0.014908	0.017094	0.104523
PRS_anx	22	-0.008529	0.064495	0.183539
PRS_anx	23	-0.009574	0.129485	0.254986

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	24	0.000456	0.923143	0.945298
PRS_anx	25	0.010804	0.064525	0.183539
PRS_anx	26	0.006872	0.083608	0.189413
PRS_anx	27	-0.008193	0.031026	0.133483
PRS_anx	28	-0.001847	0.773421	0.853041
PRS_anx	29	-0.012232	0.017808	0.104523
PRS_anx	30	-0.010051	0.113123	0.229837
PRS_anx	31	-0.005957	0.320393	0.448200
PRS_anx	32	0.000757	0.788184	0.858618
PRS_anx	33	0.011626	0.029288	0.133483
PRS_anx	34	-0.007543	0.098160	0.207677
PRS_anx	35	0.011856	0.025284	0.132138
PRS_anx	36	0.007844	0.063074	0.183539
PRS_anx	37	0.011207	0.032039	0.133483
PRS_anx	38	0.013983	0.016890	0.104523
PRS_anx	39	-0.005125	0.311245	0.440215
PRS_anx	40	-0.000341	0.956320	0.963851
PRS_anx	41	-0.008351	0.065916	0.185433
PRS_anx	42	0.018119	0.005727	0.089687
PRS_anx	43	-0.016810	0.000994	0.076630
PRS_anx	44	0.003226	0.479033	0.613162
PRS_anx	45	-0.005295	0.379271	0.509712
PRS_anx	46	-0.003582	0.216694	0.348891
PRS_anx	47	0.010578	0.053224	0.166164
PRS_anx	48	0.015473	0.004807	0.089687
PRS_anx	49	-0.002025	0.577127	0.694535
PRS_anx	50	0.010134	0.008195	0.089687
PRS_anx	51	-0.008385	0.186594	0.320590
PRS_anx	52	-0.012476	0.045620	0.155715
PRS_anx	53	-0.007744	0.145922	0.268527
PRS_anx	54	0.003891	0.335263	0.463418
PRS_anx	55	-0.009478	0.049416	0.163769
PRS_anx	56	0.007993	0.030235	0.133483
PRS_anx	57	-0.015839	0.014758	0.101871
PRS_anx	58	0.008761	0.157441	0.285850
PRS_anx	59	0.002750	0.142193	0.268527
PRS_anx	60	0.006542	0.051492	0.164774
PRS_anx	61	0.002870	0.463780	0.596621
PRS_anx	62	-0.000818	0.824864	0.887709
PRS_anx	63	-0.006734	0.253667	0.381294
PRS_anx	64	-0.007391	0.169716	0.300880
PRS_anx	65	0.010041	0.083450	0.189413
PRS_anx	66	-0.008378	0.133880	0.261628

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	67	-0.001240	0.844382	0.899426
PRS_anx	68	0.009313	0.095570	0.205862
PRS_anx	69	-0.002172	0.733388	0.816293
PRS_anx	70	0.003538	0.083021	0.189413
PRS_anx	71	0.015883	0.001167	0.076630
PRS_anx	72	-0.004732	0.036813	0.141569
PRS_anx	73	-0.005094	0.244405	0.376696
PRS_anx	74	0.002843	0.434558	0.566305
PRS_anx	75	-0.004621	0.071249	0.186121
PRS_anx	76	0.003499	0.516294	0.644738
PRS_anx	77	-0.007827	0.074874	0.189413
PRS_anx	78	-0.007008	0.255267	0.381294
PRS_anx	79	-0.006756	0.261259	0.386602
PRS_anx	80	0.003723	0.330312	0.459565
PRS_anx	81	0.007506	0.095694	0.205862
PRS_anx	82	-0.005676	0.233707	0.367049
PRS_anx	83	-0.012749	0.019243	0.104813
PRS_anx	84	-0.011806	0.001197	0.076630
PRS_anx	85	-0.009574	0.084363	0.189447
PRS_anx	86	-0.011266	0.030318	0.133483
PRS_anx	87	-0.015856	0.014115	0.100376
PRS_anx	88	-0.002636	0.642473	0.737548
PRS_anx	89	-0.001270	0.776401	0.853041
PRS_anx	90	0.002023	0.336702	0.463418
PRS_anx	91	-0.007424	0.094221	0.205862
PRS_anx	92	0.010610	0.011964	0.093002
PRS_anx	93	-0.004654	0.170242	0.300880
PRS_anx	94	0.009686	0.138848	0.267257
PRS_anx	95	0.002755	0.541028	0.660250
PRS_anx	96	0.012829	0.040179	0.144869
PRS_anx	97	0.006679	0.017667	0.104523
PRS_anx	98	-0.006309	0.181932	0.314693
PRS_anx	99	0.005561	0.177739	0.311651
PRS_anx	100	-0.007271	0.191262	0.324258
PRS_anx	101	-0.000793	0.860257	0.906279
PRS_anx	102	-0.006669	0.140050	0.267559
PRS_anx	103	-0.008548	0.043730	0.153668
PRS_anx	104	-0.000636	0.879384	0.911439
PRS_anx	105	-0.006535	0.270022	0.392760
PRS_anx	106	0.006981	0.050966	0.164774
PRS_anx	107	0.005735	0.209170	0.341068
PRS_anx	108	-0.005524	0.170420	0.300880
PRS_anx	109	0.003964	0.145718	0.268527

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	110	0.011443	0.026525	0.133483
PRS_anx	111	-0.010418	0.071016	0.186121
PRS_anx	112	-0.002880	0.613182	0.720066
PRS_anx	113	-0.004334	0.380293	0.509712
PRS_anx	114	-0.008504	0.013019	0.095509
PRS_anx	115	0.000810	0.873381	0.911439
PRS_anx	116	-0.001848	0.753796	0.835376
PRS_anx	117	0.006628	0.068604	0.186121
PRS_anx	118	-0.008505	0.118789	0.237578
PRS_anx	119	0.011189	0.027129	0.133483
PRS_anx	120	-0.005077	0.242517	0.376268
PRS_anx	121	-0.007058	0.077757	0.189413
PRS_anx	122	0.007566	0.104527	0.219335
PRS_anx	123	-0.003490	0.256182	0.381294
PRS_anx	124	0.003320	0.509436	0.644738
PRS_anx	125	0.013315	0.037051	0.141569
PRS_anx	126	0.009485	0.043820	0.153668
PRS_anx	127	-0.004195	0.213299	0.345599
PRS_anx	128	-0.003554	0.546478	0.663025
PRS_anx	129	0.011567	0.035972	0.141569
PRS_anx	130	-0.010402	0.076348	0.189413
PRS_anx	131	0.008792	0.144798	0.268527
PRS_anx	132	-0.002166	0.652228	0.742091
PRS_anx	133	-0.000315	0.850725	0.899941
PRS_anx	134	0.008321	0.117856	0.237567
PRS_anx	135	0.001545	0.786517	0.858618
PRS_anx	136	-0.001860	0.616861	0.721079
PRS_anx	137	0.014842	0.002184	0.085527
PRS_anx	138	-0.010059	0.006010	0.089687
PRS_anx	139	0.005581	0.246764	0.376696
PRS_anx	140	-0.002703	0.515708	0.644738
PRS_anx	141	0.010381	0.032328	0.133483
PRS_anx	142	-0.020524	0.001142	0.076630
PRS_anx	143	0.015504	0.006034	0.089687
PRS_anx	144	-0.008823	0.123752	0.245585
PRS_anx	145	-0.004144	0.395880	0.527812
PRS_anx	146	0.001172	0.647619	0.740136
PRS_anx	147	-0.020223	0.001768	0.085527
PRS_anx	148	0.005738	0.180428	0.314216
PRS_anx	149	0.013470	0.028983	0.133483
PRS_anx	150	-0.015193	0.006537	0.089687
PRS_anx	151	0.000671	0.885850	0.914426
PRS_anx	152	0.009757	0.069317	0.186121

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	153	0.001765	0.537034	0.660250
PRS_anx	154	0.016098	0.007570	0.089687
PRS_anx	155	0.010210	0.097918	0.207677
PRS_anx	156	-0.005004	0.078094	0.189413
PRS_anx	157	0.006823	0.080623	0.189413
PRS_anx	158	0.010772	0.029346	0.133483
PRS_anx	159	-0.007340	0.092642	0.204452
PRS_anx	160	0.015142	0.015121	0.101871
PRS_anx	161	-0.012818	0.009344	0.089687
PRS_anx	162	-0.001289	0.727846	0.813662
PRS_anx	163	-0.003765	0.530895	0.656566
PRS_anx	164	-0.012546	0.037955	0.142889
PRS_anx	165	0.004919	0.075644	0.189413
PRS_anx	166	0.002963	0.195609	0.329447
PRS_anx	167	0.010854	0.057273	0.173345
PRS_anx	168	0.000910	0.825292	0.887709
PRS_anx	169	0.010550	0.027475	0.133483
PRS_anx	170	0.004475	0.067479	0.185748
PRS_anx	171	0.011955	0.057556	0.173345
PRS_anx	172	0.012305	0.005998	0.089687
PRS_anx	173	-0.007514	0.190651	0.324258
PRS_anx	174	0.008648	0.076836	0.189413
PRS_anx	175	-0.014685	0.011802	0.093002
PRS_anx	176	-0.004651	0.275779	0.398867
PRS_anx	177	0.010491	0.083105	0.189413
PRS_anx	178	0.005712	0.105530	0.219639
PRS_anx	179	-0.001327	0.836074	0.895543
PRS_anx	180	-0.016126	0.006154	0.089687
PRS_anx	181	0.008867	0.078751	0.189413
PRS_anx	182	-0.002748	0.579566	0.694535
PRS_anx	183	0.005343	0.268278	0.392453
PRS_anx	184	-0.004558	0.228003	0.360301
PRS_anx	185	-0.004990	0.318661	0.448200
PRS_anx	186	0.013816	0.032034	0.133483
PRS_anx	187	-0.011755	0.018373	0.104523
PRS_anx	188	0.003762	0.303843	0.434547
PRS_anx	189	0.015795	0.009161	0.089687
PRS_anx	190	0.003662	0.482053	0.613958
PRS_anx	191	-0.003359	0.111019	0.229200
PRS_anx	192	0.001164	0.719001	0.807300
PRS_anx	193	-0.011555	0.002339	0.085527
PRS_anx	194	0.007983	0.144654	0.268527
PRS_anx	195	0.014902	0.009170	0.089687

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	196	-0.004047	0.541611	0.660250
PRS_anx	197	-0.000386	0.938486	0.953383
PRS_anx	198	0.013286	0.008872	0.089687
PRS_anx	199	0.013297	0.031009	0.133483
PRS_anx	200	-0.007638	0.236204	0.368708
PRS_anx	201	0.010668	0.005893	0.089687
PRS_anx	202	0.009498	0.048693	0.163769
PRS_anx	203	-0.003820	0.435789	0.566305
PRS_anx	204	-0.005486	0.112099	0.229578
PRS_anx	205	0.007266	0.207635	0.340734
PRS_anx	206	-0.010571	0.036708	0.141569
PRS_anx	207	0.012578	0.025292	0.132138
PRS_anx	208	-0.005979	0.256116	0.381294
PRS_anx	209	-0.012474	0.011212	0.093002
PRS_anx	210	0.009979	0.044550	0.154119
PRS_anx	211	-0.014499	0.011988	0.093002
PRS_anx	212	-0.006495	0.081727	0.189413
PRS_anx	213	0.000952	0.879396	0.911439
PRS_anx	214	-0.013330	0.013058	0.095509
PRS_anx	215	0.011192	0.002781	0.089007
PRS_anx	216	0.001500	0.592647	0.702396
PRS_anx	217	-0.005392	0.247207	0.376696
PRS_anx	218	-0.007740	0.018980	0.104813
PRS_anx	219	0.000378	0.926864	0.945328
PRS_anx	220	0.002390	0.694058	0.782726
PRS_anx	221	-0.000658	0.846725	0.899426
PRS_anx	222	0.016352	0.009459	0.089687
PRS_anx	223	-0.007095	0.221083	0.352009
PRS_anx	224	-0.009484	0.135588	0.262958
PRS_anx	225	0.006624	0.206751	0.340734
PRS_anx	226	-0.007659	0.074728	0.189413
PRS_anx	227	0.010847	0.090502	0.201465
PRS_anx	228	-0.003580	0.375861	0.509102
PRS_anx	229	0.001210	0.590144	0.702396
PRS_anx	230	-0.002093	0.580588	0.694535
PRS_anx	231	0.007321	0.198335	0.331855
PRS_anx	232	0.002532	0.637589	0.735237
PRS_anx	233	0.011219	0.036800	0.141569
PRS_anx	234	-0.006919	0.292734	0.421010
PRS_anx	235	0.002743	0.630893	0.733898
PRS_anx	236	-0.010298	0.053048	0.166164
PRS_anx	237	-0.002375	0.597419	0.704789
PRS_anx	238	-0.012194	0.056394	0.173345

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_anx	239	-0.010549	0.070993	0.186121
PRS_anx	240	0.013233	0.038995	0.144678
PRS_anx	241	-0.002797	0.514471	0.644738
PRS_anx	242	0.000946	0.797460	0.865042
PRS_anx	243	-0.006443	0.016416	0.104523
PRS_anx	244	0.003918	0.309955	0.440215
PRS_anx	245	0.016178	0.007983	0.089687
PRS_anx	246	0.008616	0.146851	0.268527
PRS_anx	247	-0.007945	0.063263	0.183539
PRS_anx	248	0.000152	0.972693	0.972693
PRS_anx	249	0.005324	0.203461	0.338220
PRS_anx	250	0.001724	0.524783	0.652157
PRS_anx	251	-0.003503	0.458390	0.592666
PRS_anx	252	-0.005160	0.166010	0.299285
PRS_anx	253	-0.009084	0.009246	0.089687
PRS_anx	254	0.003271	0.398874	0.527812
PRS_anx	255	0.015068	0.009962	0.091081
PRS_mdd	0	-0.030092	0.000000	0.000006
PRS_mdd	1	-0.008070	0.002084	0.003951
PRS_mdd	2	0.018255	0.002605	0.004663
PRS_mdd	3	-0.020368	0.000850	0.001814
PRS_mdd	4	0.018803	0.000661	0.001458
PRS_mdd	5	-0.016144	0.006734	0.011050
PRS_mdd	6	0.007825	0.065643	0.085303
PRS_mdd	7	-0.000507	0.915125	0.925977
PRS_mdd	8	0.036293	0.000000	0.000001
PRS_mdd	9	-0.032089	0.000001	0.000009
PRS_mdd	10	-0.012728	0.016767	0.024250
PRS_mdd	11	-0.002679	0.274149	0.314718
PRS_mdd	12	0.026387	0.000005	0.000029
PRS_mdd	13	0.025741	0.000023	0.000097
PRS_mdd	14	0.006947	0.094150	0.118731
PRS_mdd	15	0.025346	0.000070	0.000224
PRS_mdd	16	-0.007317	0.202574	0.240088
PRS_mdd	17	0.013161	0.001533	0.003019
PRS_mdd	18	0.020878	0.000166	0.000446
PRS_mdd	19	0.010595	0.002197	0.004042
PRS_mdd	20	0.027282	0.000028	0.000112
PRS_mdd	21	-0.025940	0.000043	0.000159
PRS_mdd	22	-0.023814	0.000000	0.000004
PRS_mdd	23	-0.024449	0.000113	0.000333
PRS_mdd	24	-0.006297	0.182794	0.217885
PRS_mdd	25	0.025110	0.000017	0.000079

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	26	0.012815	0.001432	0.002865
PRS_mdd	27	-0.012207	0.001643	0.003187
PRS_mdd	28	-0.018845	0.003993	0.006815
PRS_mdd	29	-0.007300	0.163481	0.197410
PRS_mdd	30	-0.019508	0.002242	0.004042
PRS_mdd	31	-0.017862	0.002935	0.005182
PRS_mdd	32	-0.005729	0.046633	0.063164
PRS_mdd	33	0.025516	0.000002	0.000014
PRS_mdd	34	-0.007714	0.093730	0.118731
PRS_mdd	35	0.019483	0.000287	0.000701
PRS_mdd	36	0.012282	0.004061	0.006885
PRS_mdd	37	0.019897	0.000180	0.000479
PRS_mdd	38	0.018197	0.002203	0.004042
PRS_mdd	39	-0.001121	0.824861	0.853223
PRS_mdd	40	-0.011381	0.069652	0.090055
PRS_mdd	41	-0.004904	0.290662	0.332186
PRS_mdd	42	0.025013	0.000160	0.000439
PRS_mdd	43	-0.029361	0.000000	0.000001
PRS_mdd	44	-0.012764	0.004410	0.007427
PRS_mdd	45	-0.024581	0.000049	0.000173
PRS_mdd	46	-0.003269	0.261418	0.301455
PRS_mdd	47	0.029743	0.000000	0.000002
PRS_mdd	48	0.025794	0.000003	0.000020
PRS_mdd	49	-0.002380	0.510124	0.549076
PRS_mdd	50	0.016772	0.000018	0.000080
PRS_mdd	51	-0.021571	0.000760	0.001649
PRS_mdd	52	-0.027201	0.000013	0.000060
PRS_mdd	53	-0.010161	0.058069	0.076235
PRS_mdd	54	0.012330	0.002228	0.004042
PRS_mdd	55	-0.016679	0.000598	0.001343
PRS_mdd	56	0.015299	0.000048	0.000173
PRS_mdd	57	-0.023038	0.000477	0.001109
PRS_mdd	58	0.019912	0.001479	0.002934
PRS_mdd	59	0.003612	0.055429	0.073171
PRS_mdd	60	0.007906	0.020166	0.028681
PRS_mdd	61	-0.007793	0.048824	0.065784
PRS_mdd	62	-0.007158	0.050995	0.067993
PRS_mdd	63	-0.019835	0.000819	0.001761
PRS_mdd	64	-0.011804	0.030364	0.042017
PRS_mdd	65	0.011605	0.050530	0.067726
PRS_mdd	66	-0.013580	0.016954	0.024383
PRS_mdd	67	-0.020903	0.000754	0.001649
PRS_mdd	68	0.014528	0.009272	0.014651

Continued on next page

PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	69	-0.007706	0.232745	0.270831
PRS_mdd	70	0.009698	0.000003	0.000020
PRS_mdd	71	0.011270	0.021862	0.030751
PRS_mdd	72	-0.007929	0.000598	0.001343
PRS_mdd	73	-0.016690	0.000098	0.000299
PRS_mdd	74	0.013413	0.000237	0.000614
PRS_mdd	75	-0.014178	0.000000	0.000001
PRS_mdd	76	0.012761	0.016738	0.024250
PRS_mdd	77	-0.005933	0.182989	0.217885
PRS_mdd	78	-0.023420	0.000144	0.000410
PRS_mdd	79	-0.029377	0.000001	0.000009
PRS_mdd	80	0.000072	0.984731	0.988593
PRS_mdd	81	0.017303	0.000148	0.000411
PRS_mdd	82	-0.020303	0.000013	0.000060
PRS_mdd	83	-0.030708	0.000000	0.000001
PRS_mdd	84	-0.011056	0.002696	0.004792
PRS_mdd	85	-0.020362	0.000383	0.000917
PRS_mdd	86	-0.021253	0.000057	0.000193
PRS_mdd	87	-0.030369	0.000003	0.000020
PRS_mdd	88	0.014018	0.012122	0.018808
PRS_mdd	89	0.003296	0.462882	0.506400
PRS_mdd	90	0.006222	0.003186	0.005548
PRS_mdd	91	-0.021054	0.000002	0.000018
PRS_mdd	92	0.006779	0.110627	0.138825
PRS_mdd	93	-0.005283	0.123021	0.151411
PRS_mdd	94	0.025269	0.000130	0.000379
PRS_mdd	95	-0.012207	0.006223	0.010278
PRS_mdd	96	0.031821	0.000000	0.000006
PRS_mdd	97	0.008845	0.001811	0.003460
PRS_mdd	98	0.002125	0.651220	0.683248
PRS_mdd	99	0.004329	0.292173	0.332428
PRS_mdd	100	-0.022693	0.000038	0.000143
PRS_mdd	101	-0.013050	0.003587	0.006183
PRS_mdd	102	-0.020139	0.000006	0.000035
PRS_mdd	103	-0.014075	0.001010	0.002119
PRS_mdd	104	0.012789	0.002125	0.004000
PRS_mdd	105	-0.026619	0.000006	0.000032
PRS_mdd	106	0.012793	0.000504	0.001151
PRS_mdd	107	0.012432	0.007001	0.011344
PRS_mdd	108	0.002072	0.607190	0.642316
PRS_mdd	109	0.003280	0.232697	0.270831
PRS_mdd	110	0.016045	0.002219	0.004042
PRS_mdd	111	-0.010792	0.065272	0.085253

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	112	0.004044	0.485401	0.528777
PRS_mdd	113	0.006899	0.155751	0.188968
PRS_mdd	114	-0.008481	0.012984	0.019904
PRS_mdd	115	0.017818	0.000368	0.000888
PRS_mdd	116	-0.021198	0.000285	0.000701
PRS_mdd	117	0.019654	0.000000	0.000002
PRS_mdd	118	-0.027679	0.000000	0.000006
PRS_mdd	119	0.023679	0.000003	0.000020
PRS_mdd	120	-0.017839	0.000050	0.000173
PRS_mdd	121	0.001865	0.637622	0.671733
PRS_mdd	122	0.007082	0.138977	0.169419
PRS_mdd	123	-0.002572	0.403222	0.450763
PRS_mdd	124	0.021119	0.000020	0.000085
PRS_mdd	125	0.016061	0.013228	0.020157
PRS_mdd	126	0.011669	0.014257	0.021597
PRS_mdd	127	-0.009661	0.005161	0.008579
PRS_mdd	128	0.004035	0.496368	0.538433
PRS_mdd	129	0.019752	0.000422	0.000992
PRS_mdd	130	-0.015749	0.007361	0.011851
PRS_mdd	131	0.023527	0.000108	0.000327
PRS_mdd	132	-0.007501	0.111698	0.139487
PRS_mdd	133	0.002087	0.211109	0.248519
PRS_mdd	134	0.025137	0.000002	0.000016
PRS_mdd	135	-0.012360	0.028274	0.039337
PRS_mdd	136	-0.003536	0.339017	0.380651
PRS_mdd	137	0.018236	0.000188	0.000497
PRS_mdd	138	-0.018899	0.000000	0.000005
PRS_mdd	139	0.009816	0.044907	0.061149
PRS_mdd	140	-0.014305	0.000641	0.001427
PRS_mdd	141	0.011319	0.021515	0.030430
PRS_mdd	142	-0.026774	0.000028	0.000112
PRS_mdd	143	0.014325	0.012681	0.019557
PRS_mdd	144	-0.005714	0.335895	0.378806
PRS_mdd	145	0.003161	0.522237	0.559384
PRS_mdd	146	-0.001551	0.547539	0.584042
PRS_mdd	147	-0.025795	0.000083	0.000261
PRS_mdd	148	0.024709	0.000000	0.000001
PRS_mdd	149	0.000061	0.992102	0.992102
PRS_mdd	150	-0.023325	0.000049	0.000173
PRS_mdd	151	0.005930	0.211630	0.248519
PRS_mdd	152	0.013029	0.015224	0.022659
PRS_mdd	153	0.006438	0.022264	0.031145
PRS_mdd	154	0.033804	0.000000	0.000001

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	155	0.022729	0.000257	0.000650
PRS_mdd	156	-0.009199	0.001395	0.002812
PRS_mdd	157	0.007548	0.055450	0.073171
PRS_mdd	158	0.019613	0.000089	0.000274
PRS_mdd	159	-0.003346	0.447908	0.494075
PRS_mdd	160	0.018566	0.003599	0.006183
PRS_mdd	161	-0.024470	0.000001	0.000010
PRS_mdd	162	0.011841	0.001174	0.002423
PRS_mdd	163	-0.020954	0.000416	0.000986
PRS_mdd	164	0.001271	0.831319	0.854689
PRS_mdd	165	0.012753	0.000005	0.000032
PRS_mdd	166	0.002344	0.304868	0.345337
PRS_mdd	167	0.010340	0.073547	0.094141
PRS_mdd	168	-0.010837	0.007920	0.012593
PRS_mdd	169	0.021569	0.000009	0.000046
PRS_mdd	170	0.013082	0.000000	0.000003
PRS_mdd	171	0.026739	0.000024	0.000102
PRS_mdd	172	0.010972	0.016531	0.024182
PRS_mdd	173	-0.001529	0.788419	0.820468
PRS_mdd	174	0.023223	0.000002	0.000018
PRS_mdd	175	-0.027898	0.000002	0.000018
PRS_mdd	176	-0.000532	0.901905	0.916221
PRS_mdd	177	0.027419	0.000007	0.000035
PRS_mdd	178	0.008526	0.016482	0.024182
PRS_mdd	179	0.011087	0.087130	0.110972
PRS_mdd	180	-0.026922	0.000009	0.000046
PRS_mdd	181	0.025711	0.000000	0.000006
PRS_mdd	182	-0.010098	0.041469	0.056771
PRS_mdd	183	0.018103	0.000166	0.000446
PRS_mdd	184	-0.015179	0.000067	0.000221
PRS_mdd	185	-0.019338	0.000147	0.000411
PRS_mdd	186	0.028946	0.000009	0.000047
PRS_mdd	187	-0.021053	0.000029	0.000115
PRS_mdd	188	0.016185	0.000010	0.000048
PRS_mdd	189	0.013099	0.032185	0.044298
PRS_mdd	190	-0.012766	0.014989	0.022572
PRS_mdd	191	-0.003254	0.119320	0.148281
PRS_mdd	192	-0.005095	0.120488	0.149009
PRS_mdd	193	-0.009860	0.010246	0.016091
PRS_mdd	194	0.022287	0.000054	0.000183
PRS_mdd	195	0.021232	0.000252	0.000644
PRS_mdd	196	-0.030145	0.000003	0.000021
PRS_mdd	197	0.003306	0.510469	0.549076

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	198	0.023325	0.000006	0.000035
PRS_mdd	199	0.020307	0.001225	0.002510
PRS_mdd	200	-0.022963	0.000288	0.000701
PRS_mdd	201	0.000864	0.826560	0.853223
PRS_mdd	202	0.027677	0.000000	0.000001
PRS_mdd	203	-0.019415	0.000085	0.000266
PRS_mdd	204	-0.000599	0.861057	0.881722
PRS_mdd	205	0.023944	0.000035	0.000136
PRS_mdd	206	-0.012438	0.016377	0.024182
PRS_mdd	207	0.024620	0.000016	0.000074
PRS_mdd	208	-0.016846	0.001086	0.002260
PRS_mdd	209	-0.026198	0.000000	0.000004
PRS_mdd	210	0.001349	0.787472	0.820468
PRS_mdd	211	-0.020722	0.000485	0.001118
PRS_mdd	212	0.000307	0.934302	0.941658
PRS_mdd	213	0.015235	0.015202	0.022659
PRS_mdd	214	-0.026078	0.000002	0.000015
PRS_mdd	215	0.018782	0.000001	0.000008
PRS_mdd	216	-0.002132	0.449686	0.494075
PRS_mdd	217	-0.014375	0.001769	0.003405
PRS_mdd	218	-0.005000	0.133031	0.162947
PRS_mdd	219	-0.007483	0.071810	0.092379
PRS_mdd	220	0.023326	0.000135	0.000388
PRS_mdd	221	-0.003823	0.256240	0.296822
PRS_mdd	222	0.023450	0.000275	0.000690
PRS_mdd	223	-0.015856	0.006988	0.011344
PRS_mdd	224	-0.024841	0.000113	0.000333
PRS_mdd	225	0.026397	0.000000	0.000006
PRS_mdd	226	-0.010317	0.017553	0.025104
PRS_mdd	227	0.029438	0.000004	0.000026
PRS_mdd	228	-0.000576	0.887456	0.905135
PRS_mdd	229	0.001254	0.567324	0.602635
PRS_mdd	230	-0.011808	0.001601	0.003129
PRS_mdd	231	0.022508	0.000070	0.000224
PRS_mdd	232	0.017158	0.001370	0.002784
PRS_mdd	233	0.026948	0.000000	0.000006
PRS_mdd	234	-0.027015	0.000045	0.000166
PRS_mdd	235	-0.015727	0.004746	0.007941
PRS_mdd	236	-0.026387	0.000001	0.000009
PRS_mdd	237	-0.017440	0.000066	0.000218
PRS_mdd	238	-0.031479	0.000001	0.000009
PRS_mdd	239	-0.024770	0.000028	0.000112
PRS_mdd	240	0.027652	0.000018	0.000079

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PRS	Dim	β_{PRS}	p-value	p_{FDR}
PRS_mdd	241	0.012552	0.003125	0.005479
PRS_mdd	242	0.012075	0.000903	0.001911
PRS_mdd	243	-0.010125	0.000194	0.000507
PRS_mdd	244	0.003098	0.425980	0.474134
PRS_mdd	245	0.030456	0.000001	0.000009
PRS_mdd	246	0.024357	0.000041	0.000155
PRS_mdd	247	-0.013383	0.002199	0.004042
PRS_mdd	248	0.003416	0.445591	0.493815
PRS_mdd	249	0.018899	0.000006	0.000032
PRS_mdd	250	0.003682	0.178450	0.214475
PRS_mdd	251	-0.011902	0.011383	0.017768
PRS_mdd	252	-0.018015	0.000001	0.000011
PRS_mdd	253	-0.018651	0.000000	0.000003
PRS_mdd	254	0.010285	0.007441	0.011906
PRS_mdd	255	0.028150	0.000002	0.000014

3.5 List of FreeSurfer Measures

Table 17: List of Freesurfer measures used for deviation association analysis and classification baseline

FreeSurfer Measure
aseg.volume_Left-Cerebellum-Cortex
aseg.volume_Left-Thalamus
aseg.volume_Left-Caudate
aseg.volume_Left-Putamen
aseg.volume_Left-Pallidum
aseg.volume_Left-Hippocampus
aseg.volume_Left-Amygdala
aseg.volume_Left-Accumbens-area
aseg.volume_Left-VentralDC
aseg.volume_Right-Cerebellum-Cortex
aseg.volume_Right-Thalamus
aseg.volume_Right-Caudate
aseg.volume_Right-Putamen
aseg.volume_Right-Pallidum
aseg.volume_Right-Hippocampus
aseg.volume_Right-Amygdala
aseg.volume_Right-Accumbens-area
aseg.volume_Right-VentralDC
aseg.volume_non-WM-hypointensities
aseg.volume_Left-non-WM-hypointensities
aseg.volume_Right-non-WM-hypointensities

FreeSurfer Measure (continued)
aseg.volume_BrainSegVol
aseg.volume_BrainSegVolNotVent
aseg.volume_lhCortexVol
aseg.volume_rhCortexVol
aseg.volume_CortexVol
aseg.volume_SubCortGrayVol
aseg.volume_TotalGrayVol
aseg.volume_SupraTentorialVol
aseg.volume_SupraTentorialVolNotVent
aseg.volume_EstimatedTotalIntraCranialVol
lh.aparc.volume_lh_bankssts_volume
lh.aparc.volume_lh_caudalanteriorcingulate_volume
lh.aparc.volume_lh_caudalmiddlefrontal_volume
lh.aparc.volume_lh_cuneus_volume
lh.aparc.volume_lh_entorhinal_volume
lh.aparc.volume_lh_fusiform_volume
lh.aparc.volume_lh_inferiorparietal_volume
lh.aparc.volume_lh_inferiortemporal_volume
lh.aparc.volume_lh_isthmuscingulate_volume
lh.aparc.volume_lh_lateraloccipital_volume
lh.aparc.volume_lh_lateralorbitofrontal_volume
lh.aparc.volume_lh_lingual_volume
lh.aparc.volume_lh_medialorbitofrontal_volume
lh.aparc.volume_lh_middletemporal_volume
lh.aparc.volume_lh_parahippocampal_volume
lh.aparc.volume_lh_paracentral_volume
lh.aparc.volume_lh_parsopercularis_volume
lh.aparc.volume_lh_parsorbitalis_volume
lh.aparc.volume_lh_parstriangularis_volume
lh.aparc.volume_lh_pericalcarine_volume
lh.aparc.volume_lh_postcentral_volume
lh.aparc.volume_lh_posteriorcingulate_volume
lh.aparc.volume_lh_precentral_volume
lh.aparc.volume_lh_precuneus_volume
lh.aparc.volume_lh_rostralanteriorcingulate_volume
lh.aparc.volume_lh_rostralmiddlefrontal_volume
lh.aparc.volume_lh_superiorfrontal_volume
lh.aparc.volume_lh_superiorparietal_volume
lh.aparc.volume_lh_superiortemporal_volume
lh.aparc.volume_lh_supramarginal_volume
lh.aparc.volume_lh_frontalpole_volume
lh.aparc.volume_lh_temporalpole_volume
lh.aparc.volume_lh_transversetemporal_volume
lh.aparc.volume_lh_insula_volume
rh.aparc.volume_rh_bankssts_volume

FreeSurfer Measure (continued)
rh.aparc.volume_rh_caudalanteriorcingulate_volume
rh.aparc.volume_rh_caudalmiddlefrontal_volume
rh.aparc.volume_rh_cuneus_volume
rh.aparc.volume_rh_entorhinal_volume
rh.aparc.volume_rh_fusiform_volume
rh.aparc.volume_rh_inferiorparietal_volume
rh.aparc.volume_rh_inferiortemporal_volume
rh.aparc.volume_rh_isthmuscingulate_volume
rh.aparc.volume_rh_lateraloccipital_volume
rh.aparc.volume_rh_lateralorbitofrontal_volume
rh.aparc.volume_rh_lingual_volume
rh.aparc.volume_rh_medialorbitofrontal_volume
rh.aparc.volume_rh_middletemporal_volume
rh.aparc.volume_rh_parahippocampal_volume
rh.aparc.volume_rh_paracentral_volume
rh.aparc.volume_rh_parsopercularis_volume
rh.aparc.volume_rh_parsorbitalis_volume
rh.aparc.volume_rh_parstriangularis_volume
rh.aparc.volume_rh_pericalcarine_volume
rh.aparc.volume_rh_postcentral_volume
rh.aparc.volume_rh_posteriorcingulate_volume
rh.aparc.volume_rh_precentral_volume
rh.aparc.volume_rh_precuneus_volume
rh.aparc.volume_rh_rostralanteriorcingulate_volume
rh.aparc.volume_rh_rostralmiddlefrontal_volume
rh.aparc.volume_rh_superiorfrontal_volume
rh.aparc.volume_rh_superiorparietal_volume
rh.aparc.volume_rh_superiortemporal_volume
rh.aparc.volume_rh_supramarginal_volume
rh.aparc.volume_rh_frontalpole_volume
rh.aparc.volume_rh_temporalpole_volume
rh.aparc.volume_rh_transversetemporal_volume
rh.aparc.volume_rh_insula_volume

3.6 Correlation Analysis

Table 18: Significant Spearman rank correlations between latent embedding dimensions and symptom severity scores after false discovery rate (FDR) correction ($q < 0.05$). The estimated proportion of true null hypotheses (π_0), derived using the q-value procedure [12], was 0.74. For each association, Spearman's r, uncorrected p-values, and corresponding FDR-adjusted q-values are reported.

Score	Dimension	Spearman r	q_{value}	$p_{\text{value\_uncorrected}}$
AUDIT-C sum score	48	-0.027	1.135e-03	3.738e-06
AUDIT-C sum score	68	-0.027	1.135e-03	4.027e-06
AUDIT-C sum score	221	0.026	1.982e-03	1.055e-05
AUDIT-C sum score	20	-0.025	2.174e-03	1.691e-05
AUDIT-C sum score	136	0.025	2.174e-03	1.929e-05
AUDIT-C sum score	13	-0.024	3.245e-03	3.582e-05
AUDIT-C sum score	142	0.024	3.245e-03	4.605e-05
AUDIT-C sum score	145	-0.024	3.245e-03	4.563e-05
AUDIT-C sum score	114	0.024	3.498e-03	5.585e-05
AUDIT-C sum score	213	0.024	3.793e-03	6.729e-05
AUDIT-C sum score	16	-0.023	3.817e-03	7.449e-05
AUDIT-C sum score	217	0.023	5.072e-03	1.260e-04
AUDIT-C sum score	207	0.022	7.509e-03	2.132e-04
AUDIT-C sum score	150	0.021	9.336e-03	2.982e-04
AUDIT-C sum score	227	-0.021	9.336e-03	2.837e-04
AUDIT-C sum score	52	0.021	9.996e-03	3.370e-04
AUDIT-C sum score	100	0.021	1.120e-02	4.174e-04
AUDIT-C sum score	224	-0.021	1.120e-02	4.165e-04
AUDIT-C sum score	162	0.021	1.135e-02	4.553e-04
AUDIT-C sum score	204	-0.021	1.135e-02	4.631e-04
AUDIT-C sum score	155	0.020	1.155e-02	5.326e-04
AUDIT-C sum score	86	-0.020	1.268e-02	6.074e-04
AUDIT-C sum score	73	0.020	1.386e-02	6.884e-04
AUDIT-C sum score	62	0.019	2.478e-02	1.599e-03
AUDIT-C sum score	87	0.019	2.478e-02	1.528e-03
AUDIT-C sum score	122	0.019	2.478e-02	1.581e-03
AUDIT-C sum score	216	-0.019	2.478e-02	1.533e-03
AUDIT-C sum score	182	0.018	2.900e-02	1.955e-03
AUDIT-C sum score	102	0.018	3.010e-02	2.083e-03
AUDIT-C sum score	112	0.018	3.104e-02	2.238e-03
AUDIT-C sum score	223	-0.017	3.931e-02	3.208e-03
AUDIT-C sum score	31	-0.017	4.784e-02	4.244e-03
AUDIT-C sum score	177	-0.017	4.784e-02	4.161e-03
AUDIT-C sum score	61	0.017	4.888e-02	4.509e-03
AUDIT-C sum score	173	0.017	4.901e-02	4.609e-03
GAD-7 sum score	100	-0.019	2.478e-02	1.306e-03
GAD-7 sum score	241	0.019	2.478e-02	1.445e-03

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Table 18: Significant Spearman rank correlations between latent embedding dimensions and symptom severity scores after false discovery rate (FDR) correction ($q < 0.05$). The estimated proportion of true null hypotheses (π_0), derived using the q-value procedure [12], was 0.74. For each association, Spearman's r, uncorrected p-values, and corresponding FDR-adjusted q-values are reported.

Score	Dimension	Spearman r	q_{value}	$p_{\text{value\_uncorrected}}$
GAD-7 sum score	217	-0.017	3.931e-02	3.087e-03
GAD-7 sum score	58	0.017	4.821e-02	4.362e-03
PHQ-9 sum score	76	0.023	4.865e-03	1.069e-04
PHQ-9 sum score	217	-0.023	4.865e-03	1.122e-04
PHQ-9 sum score	246	0.022	6.592e-03	1.754e-04
PHQ-9 sum score	100	-0.021	1.155e-02	4.924e-04
PHQ-9 sum score	205	0.020	1.155e-02	5.170e-04
PHQ-9 sum score	132	-0.019	2.478e-02	1.626e-03
PHQ-9 sum score	225	0.019	2.478e-02	1.418e-03
PHQ-9 sum score	231	0.019	2.478e-02	1.606e-03
PHQ-9 sum score	6	-0.018	3.104e-02	2.313e-03
PHQ-9 sum score	233	0.018	3.104e-02	2.267e-03
PHQ-9 sum score	45	-0.017	3.931e-02	3.203e-03
PHQ-9 sum score	91	-0.017	3.931e-02	3.126e-03
PHQ-9 sum score	227	0.017	4.161e-02	3.470e-03
PHQ-9 sum score	216	-0.017	4.784e-02	4.222e-03

3.7 z-Scored Symptom Score Mapping Brains

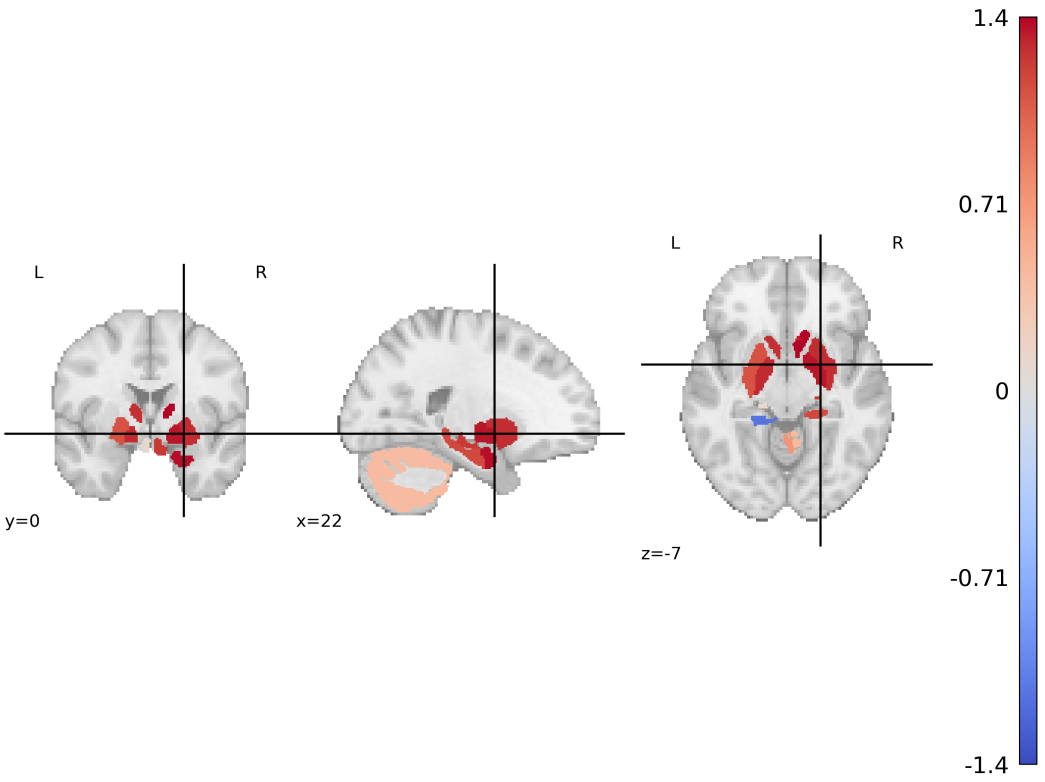

Figure 8: Z-scored heuristic associations between latent embedding dimensions and PHQ-9 (Patient Health Questionnaire-9) depression sum scores, mapped onto the MNI-152 (Montreal Neurological Institute) brain template. Higher z-scores indicate stronger relative associations across brain regions.

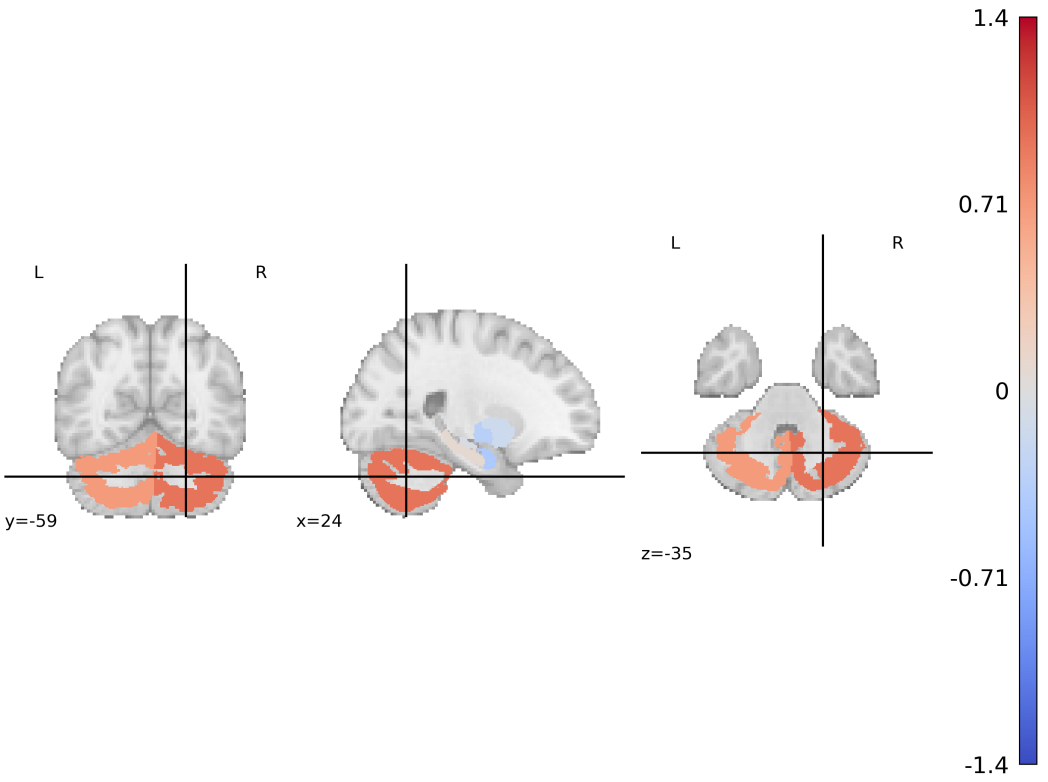

Figure 9: Z-scored heuristic associations between latent embedding dimensions and GAD-7 (Generalized Anxiety Disorder-7) anxiety sum scores, mapped onto the MNI-152 (Montreal Neurological Institute) brain template. Higher z-scores indicate stronger relative associations across brain regions.

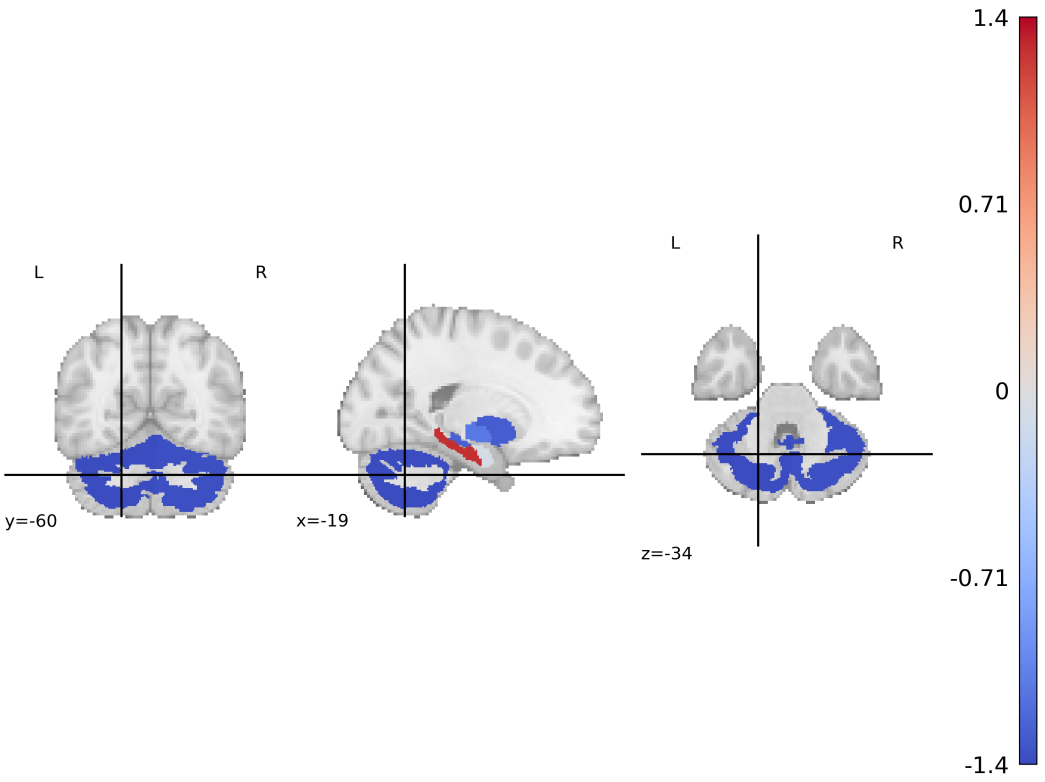

Figure 10: Z-scored heuristic associations between latent embedding dimensions and AUDIT-C (Alcohol Use Disorders Identification Test–Consumption) alcohol use sum scores, mapped onto the MNI-152 (Montreal Neurological Institute) brain template. Higher z-scores indicate stronger relative associations across brain regions.

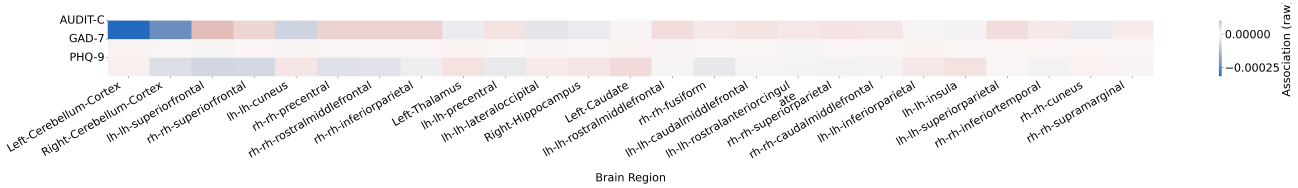

Figure 11: Top 25 brain regions ranked by absolute effect size of heuristic associations between latent embedding dimensions and symptom severity scores. Rows correspond to AUDIT-C (Alcohol Use Disorders Identification Test–Consumption), GAD-7 (Generalized Anxiety Disorder-7), and PHQ-9 (Patient Health Questionnaire-9). Columns indicate FreeSurfer-derived brain regions. Colors denote the relative strength and direction of association (blue = negative, red = positive), with the scale representing association strength.

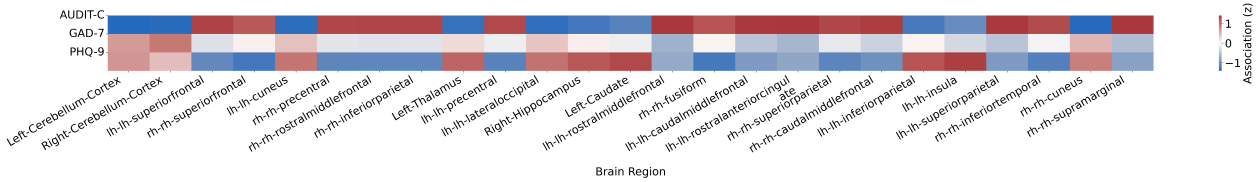

Figure 12: Top 25 brain regions ranked by absolute effect size of z-scored heuristic associations between latent embedding dimensions and symptom severity scores. Rows correspond to AUDIT-C (Alcohol Use Disorders Identification Test–Consumption), GAD-7 (Generalized Anxiety Disorder-7), and PHQ-9 (Patient Health Questionnaire-9). Columns indicate FreeSurfer-derived brain regions. Colors denote standardized association strength (z-scores), with blue indicating negative associations and red indicating positive associations. Z-scoring was applied across all regions to emphasize relative patterns.

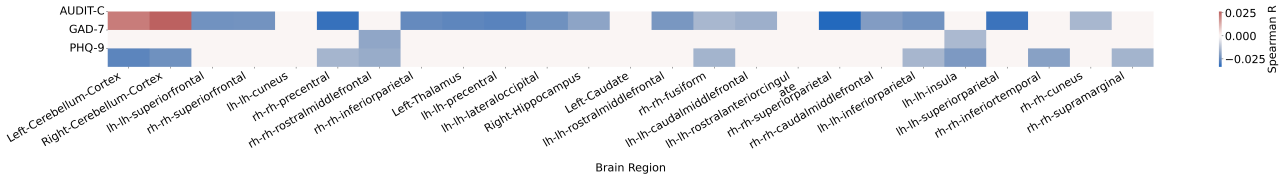

Figure 13: Top 25 brain regions ranked by absolute effect size of Spearman's ρ correlations between FreeSurfer-derived structural features and symptom severity scores. Rows correspond to AUDIT-C (Alcohol Use Disorders Identification Test–Consumption), GAD-7 (Generalized Anxiety Disorder-7), and PHQ-9 (Patient Health Questionnaire-9). Columns indicate individual FreeSurfer brain regions. Colors represent the strength and direction of correlations (blue = negative, red = positive), with intensity reflecting absolute correlation magnitude.

3.8 Classification Baseline

Group	Confounders only		PRS only		FreeSurfer only		PRS + FreeSurfer	
	BACC	AUC	BACC	AUC	BACC	AUC	BACC	AUC
PHQ-9 (1)	58 ± 1	61 ± 1	60 ± 1	63 ± 1	58 ± 1	61 ± 1	60 ± 1	63 ± 1
PHQ-9 (2)	61 ± 2	65 ± 2	64 ± 2	68 ± 3	61 ± 3	65 ± 2	63 ± 3	68 ± 3
PHQ-9 (3)	57 ± 9	59 ± 15	58 ± 9	62 ± 12	65 ± 3	70 ± 3	67 ± 2	72 ± 3
PHQ-9 (4)	57 ± 16	59 ± 29	70 ± 9	77 ± 8	69 ± 7	76 ± 7	70 ± 5	78 ± 4
MDD ICD-10	57 ± 3	61 ± 3	62 ± 2	68 ± 2	58 ± 3	61 ± 3	62 ± 2	67 ± 2
MDD (diag.)	58 ± 1	61 ± 1	60 ± 1	64 ± 1	58 ± 1	61 ± 2	60 ± 2	64 ± 2
GAD-7 (2)	58 ± 2	61 ± 2	59 ± 1	64 ± 1	58 ± 2	61 ± 2	59 ± 1	63 ± 1
GAD-7 (3)	57 ± 5	61 ± 7	63 ± 3	68 ± 3	57 ± 4	61 ± 4	60 ± 3	65 ± 3
GAD-7 (4)	62 ± 7	66 ± 13	63 ± 7	69 ± 9	63 ± 4	69 ± 5	66 ± 5	73 ± 6
ANX ICD-10	56 ± 4	60 ± 4	62 ± 2	67 ± 2	57 ± 3	60 ± 3	61 ± 3	66 ± 2
ANX (diag.)	56 ± 2	58 ± 2	58 ± 2	62 ± 3	56 ± 2	58 ± 2	58 ± 2	61 ± 3
AUDIT-C (8)	60 ± 3	65 ± 3	61 ± 2	65 ± 3	60 ± 3	63 ± 3	60 ± 2	64 ± 3
AUDIT-C (9)	63 ± 3	68 ± 4	65 ± 3	69 ± 4	62 ± 4	66 ± 3	63 ± 3	67 ± 3
AUDIT-C ($\geq$ 10)	63 ± 3	68 ± 3	64 ± 2	69 ± 3	64 ± 3	69 ± 3	65 ± 2	70 ± 3
AUD ICD-10	58 ± 8	57 ± 11	56 ± 6	58 ± 7	58 ± 5	64 ± 6	60 ± 4	65 ± 5

Table 19: Balanced accuracy (BACC; computed at a decision threshold of 0.5) and area under the receiver operating characteristic curve (AUC) for classification across all diagnostic outcomes in the UKB test set. Models included: *Confounders only* (sex, age, age-squared, and age–sex interaction), *PRS only* (polygenic risk scores with covariates), *FreeSurfer only* (256-dimensional FreeSurfer-derived brain features with covariates), and *PRS + FreeSurfer* (combined model). Values represent mean ± standard deviation across 10-fold stratified cross-validation.

3.9 Classification Performance Details

Table 20: Balanced accuracy (BACC; computed at a decision threshold of 0.5) distributions across 10-fold stratified cross-validation for all diagnostic outcomes. Columns show the minimum, maximum, mean, median, and standard deviation of BACC values across folds. Model configurations include: *Confounders only* (sex, age, age-squared, age–sex interaction), *PRS + covariates* (polygenic risk scores with covariates), *Deviation 256d + covariates* (256-dimensional brain deviations with covariates), and *PRS + Deviation 256d + covariates* (combined model).

Target	Config	Min	Max	Mean	Median	Std
MDD ICD-10	Confounders only	0.53	0.65	0.57	0.57	0.03
MDD ICD-10	PRS + covariates	0.59	0.66	0.62	0.62	0.02
MDD ICD-10	Deviation 256d + covariates	0.58	0.67	0.62	0.62	0.03
MDD ICD-10	PRS + Deviation 256d + covariates	0.62	0.70	0.65	0.65	0.02
PHQ-9 (1)	Confounders only	0.56	0.60	0.58	0.58	0.01
PHQ-9 (1)	PRS + covariates	0.58	0.62	0.60	0.60	0.01

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Target	Config	Min	Max	Mean	Median	Std
PHQ-9 (1)	Deviation 256d + covariates	0.56	0.61	0.59	0.59	0.02
PHQ-9 (1)	PRS + Deviation 256d + covariates	0.59	0.62	0.60	0.60	0.01
PHQ-9 (2)	Confounders only	0.58	0.64	0.61	0.61	0.02
PHQ-9 (2)	PRS + covariates	0.61	0.67	0.64	0.64	0.02
PHQ-9 (2)	Deviation 256d + covariates	0.60	0.67	0.63	0.62	0.02
PHQ-9 (2)	PRS + Deviation 256d + covariates	0.62	0.68	0.65	0.65	0.02
PHQ-9 (3)	Confounders only	0.47	0.73	0.62	0.62	0.07
PHQ-9 (3)	PRS + covariates	0.42	0.71	0.61	0.67	0.11
PHQ-9 (3)	Deviation 256d + covariates	0.51	0.68	0.61	0.61	0.06
PHQ-9 (3)	PRS + Deviation 256d + covariates	0.51	0.71	0.63	0.66	0.07
PHQ (4)	Confounders only	0.31	0.77	0.59	0.66	0.18
PHQ (4)	PRS + covariates	0.62	0.84	0.72	0.72	0.07
PHQ (4)	Deviation 256d + covariates	0.56	0.81	0.70	0.71	0.07
PHQ (4)	PRS + Deviation 256d + covariates	0.65	0.88	0.74	0.74	0.07
GAD (2)	Confounders only	0.55	0.60	0.58	0.59	0.02
GAD (2)	PRS + covariates	0.58	0.61	0.59	0.59	0.01
GAD (2)	Deviation 256d + covariates	0.55	0.61	0.58	0.59	0.02
GAD (2)	PRS + Deviation 256d + covariates	0.58	0.62	0.60	0.60	0.01
GAD (3)	Confounders only	0.53	0.62	0.58	0.57	0.03
GAD (3)	PRS + covariates	0.58	0.67	0.63	0.62	0.03
GAD (3)	Deviation 256d + covariates	0.58	0.65	0.61	0.60	0.02
GAD (3)	PRS + Deviation 256d + covariates	0.60	0.68	0.63	0.62	0.03
GAD (4)	Confounders only	0.53	0.70	0.65	0.67	0.05
GAD (4)	PRS + covariates	0.50	0.74	0.65	0.65	0.08
GAD (4)	Deviation 256d + covariates	0.53	0.71	0.62	0.63	0.05
GAD (4)	PRS + Deviation 256d + covariates	0.53	0.70	0.63	0.64	0.05
ANX ICD-10	Confounders only	0.50	0.60	0.56	0.56	0.03
ANX ICD-10	PRS + covariates	0.59	0.65	0.62	0.62	0.02
ANX ICD-10	Deviation 256d + covariates	0.55	0.62	0.58	0.58	0.02
ANX ICD-10	PRS + Deviation 256d + covariates	0.57	0.66	0.62	0.62	0.03
AUD ICD-10	Confounders only	0.49	0.65	0.57	0.56	0.06
AUD ICD-10	PRS + covariates	0.50	0.67	0.59	0.60	0.07
AUD ICD-10	Deviation 256d + covariates	0.55	0.68	0.62	0.62	0.04
AUD ICD-10	PRS + Deviation 256d + covariates	0.50	0.72	0.59	0.58	0.06
AUDIT-C (8)	Confounders only	0.56	0.64	0.60	0.59	0.03
AUDIT-C (8)	PRS + covariates	0.58	0.64	0.61	0.61	0.02
AUDIT-C (8)	Deviation 256d + covariates	0.53	0.64	0.60	0.61	0.03
AUDIT-C (8)	PRS + Deviation 256d + covariates	0.55	0.64	0.60	0.61	0.03
AUDIT-C (9)	Confounders only	0.58	0.68	0.63	0.64	0.04
AUDIT-C (9)	PRS + covariates	0.58	0.70	0.65	0.66	0.04
AUDIT-C (9)	Deviation 256d + covariates	0.57	0.69	0.64	0.64	0.04
AUDIT-C (9)	PRS + Deviation 256d + covariates	0.59	0.70	0.65	0.65	0.04
AUDIT-C (10)	Confounders only	0.57	0.68	0.63	0.63	0.03

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Target	Config	Min	Max	Mean	Median	Std
AUDIT-C (10)	PRS + covariates	0.57	0.66	0.64	0.64	0.03
AUDIT-C (10)	Deviation 256d + covariates	0.60	0.69	0.66	0.66	0.03
AUDIT-C (10)	PRS + Deviation 256d + covariates	0.60	0.70	0.66	0.66	0.03
MDD (diag.)	Confounders only	0.56	0.60	0.58	0.58	0.01
MDD (diag.)	PRS + covariates	0.58	0.62	0.60	0.60	0.01
MDD (diag.)	Deviation 256d + covariates	0.56	0.61	0.59	0.59	0.01
MDD (diag.)	PRS + Deviation 256d + covariates	0.60	0.63	0.61	0.61	0.01
ANX (diag.)	Confounders only	0.53	0.59	0.56	0.56	0.02
ANX (diag.)	PRS + covariates	0.56	0.63	0.58	0.58	0.02
ANX (diag.)	Deviation 256d + covariates	0.54	0.59	0.57	0.57	0.02
ANX (diag.)	PRS + Deviation 256d + covariates	0.56	0.61	0.59	0.59	0.02

Table 21: Area under receiver operating characteristic curve (AUC) distributions across 10-fold stratified cross-validation for all diagnostic outcomes. Columns show the minimum, maximum, mean, median, and standard deviation of balanced accuracy (BACC; computed at a decision threshold of 0.5) values across folds. Model configurations include: *Confounders only* (sex, age, age-squared, age–sex interaction), *PRS + covariates* (polygenic risk scores with covariates), *Deviation 256d + covariates* (256-dimensional brain deviations with covariates), and *PRS + Deviation 256d + covariates* (combined model).

Target	Config	Min	Max	Mean	Median	Std
MDD ICD-10	Confounders only	0.53	0.68	0.61	0.61	0.04
MDD ICD-10	PRS + covariates	0.64	0.72	0.68	0.68	0.02
MDD ICD-10	Deviation 256d + covariates	0.62	0.72	0.66	0.66	0.03
MDD ICD-10	PRS + Deviation 256d + covariates	0.68	0.72	0.70	0.71	0.02
PHQ (1)	Confounders only	0.58	0.62	0.61	0.61	0.01
PHQ (1)	PRS + covariates	0.61	0.66	0.63	0.63	0.02
PHQ (1)	Deviation 256d + covariates	0.59	0.64	0.61	0.61	0.01
PHQ (1)	PRS + Deviation 256d + covariates	0.61	0.66	0.64	0.63	0.02
PHQ (2)	Confounders only	0.62	0.71	0.65	0.65	0.02
PHQ (2)	PRS + covariates	0.63	0.74	0.68	0.68	0.03
PHQ (2)	Deviation 256d + covariates	0.63	0.70	0.67	0.67	0.02
PHQ (2)	PRS + Deviation 256d + covariates	0.66	0.73	0.70	0.70	0.02
PHQ (3)	Confounders only	0.48	0.75	0.68	0.69	0.08
PHQ (3)	PRS + covariates	0.34	0.78	0.65	0.70	0.14
PHQ (3)	Deviation 256d + covariates	0.55	0.74	0.66	0.68	0.07
PHQ (3)	PRS + Deviation 256d + covariates	0.54	0.75	0.68	0.68	0.07
PHQ (4)	Confounders only	0.13	0.89	0.59	0.71	0.30
PHQ (4)	PRS + covariates	0.66	0.92	0.77	0.76	0.08
PHQ (4)	Deviation 256d + covariates	0.64	0.86	0.75	0.74	0.08
PHQ (4)	PRS + Deviation 256d + covariates	0.68	0.91	0.80	0.80	0.07

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Target	Config	Min	Max	Mean	Median	Std
GAD (2)	Confounders only	0.58	0.64	0.61	0.62	0.02
GAD (2)	PRS + covariates	0.62	0.66	0.64	0.64	0.01
GAD (2)	Deviation 256d + covariates	0.59	0.64	0.61	0.62	0.02
GAD (2)	PRS + Deviation 256d + covariates	0.62	0.65	0.64	0.64	0.01
GAD (3)	Confounders only	0.57	0.67	0.63	0.63	0.03
GAD (3)	PRS + covariates	0.64	0.74	0.68	0.68	0.03
GAD (3)	Deviation 256d + covariates	0.58	0.69	0.63	0.63	0.03
GAD (3)	PRS + Deviation 256d + covariates	0.62	0.74	0.67	0.68	0.03
GAD (4)	Confounders only	0.55	0.77	0.70	0.73	0.07
GAD (4)	PRS + covariates	0.47	0.81	0.69	0.72	0.11
GAD (4)	Deviation 256d + covariates	0.54	0.73	0.65	0.65	0.06
GAD (4)	PRS + Deviation 256d + covariates	0.53	0.76	0.68	0.68	0.07
ANX ICD-10	Confounders only	0.52	0.65	0.59	0.59	0.05
ANX ICD-10	PRS + covariates	0.63	0.70	0.67	0.67	0.02
ANX ICD-10	Deviation 256d + covariates	0.58	0.68	0.63	0.63	0.04
ANX ICD-10	PRS + Deviation 256d + covariates	0.63	0.72	0.67	0.68	0.03
AUD ICD-10	Confounders only	0.46	0.68	0.59	0.62	0.08
AUD ICD-10	PRS + covariates	0.51	0.71	0.61	0.62	0.07
AUD ICD-10	Deviation 256d + covariates	0.52	0.70	0.65	0.66	0.05
AUD ICD-10	PRS + Deviation 256d + covariates	0.57	0.75	0.64	0.62	0.06
AUDIT-C (8)	Confounders only	0.58	0.70	0.65	0.64	0.04
AUDIT-C (8)	PRS + covariates	0.59	0.69	0.65	0.65	0.03
AUDIT-C (8)	Deviation 256d + covariates	0.57	0.70	0.65	0.64	0.04
AUDIT-C (8)	PRS + Deviation 256d + covariates	0.58	0.69	0.65	0.65	0.03
AUDIT-C (9)	Confounders only	0.61	0.75	0.68	0.69	0.04
AUDIT-C (9)	PRS + covariates	0.61	0.75	0.69	0.70	0.04
AUDIT-C (9)	Deviation 256d + covariates	0.63	0.76	0.69	0.69	0.04
AUDIT-C (9)	PRS + Deviation 256d + covariates	0.63	0.77	0.70	0.69	0.04
AUDIT-C (10)	Confounders only	0.62	0.71	0.68	0.69	0.03
AUDIT-C (10)	PRS + covariates	0.62	0.72	0.69	0.70	0.03
AUDIT-C (10)	Deviation 256d + covariates	0.65	0.75	0.72	0.72	0.03
AUDIT-C (10)	PRS + Deviation 256d + covariates	0.65	0.76	0.73	0.73	0.03
MDD (diag.)	Confounders only	0.58	0.63	0.61	0.61	0.02
MDD (diag.)	PRS + covariates	0.62	0.68	0.64	0.65	0.02
MDD (diag.)	Deviation 256d + covariates	0.60	0.64	0.62	0.62	0.01
MDD (diag.)	PRS + Deviation 256d + covariates	0.64	0.68	0.65	0.65	0.01
ANX (diag.)	Confounders only	0.55	0.62	0.58	0.58	0.02
ANX (diag.)	PRS + covariates	0.58	0.67	0.62	0.61	0.03
ANX (diag.)	Deviation 256d + covariates	0.55	0.62	0.60	0.60	0.02
ANX (diag.)	PRS + Deviation 256d + covariates	0.60	0.65	0.63	0.63	0.02

Bibliography

[1] Kaiming He, Haoqi Fan, Yuxin Wu, Saining Xie, and Ross Girshick. Momentum contrast for unsupervised visual representation learning. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*, pages 9729–9738, 2020. doi: 10.1109/CVPR42600.2020.00975.

[2] Fernando Pérez-García, Rachel Sparks, and Sébastien Ourselin. TorchIO: A python library for efficient loading, preprocessing, augmentation and patch-based sampling of medical images in deep learning. *Computer Methods and Programs in Biomedicine*, 208:106236, 2021. doi: 10.1016/j.cmpb.2021.106236.

[3] Adam Paszke, Sam Gross, Soumith Chintala, Gregory Chanan, Edward Yang, Zachary DeVito, Zeming Lin, Alban Desmaison, Luca Antiga, and Adam Lerer. Automatic differentiation in PyTorch. 2017.

[4] Diederik P. Kingma and Jimmy Ba. Adam: A method for stochastic optimization, 2017.

[5] Bruce Fischl. Freesurfer. *NeuroImage*, 62(2):774–781, 2012. ISSN 1053-8119. doi: 10.1016/j.neuroimage.2012.01.021. 20 YEARS OF fMRI.

[6] R. De Maesschalck, D. Jouan-Rimbaud, and D.L. Massart. The Mahalanobis distance. *Chemometrics and Intelligent Laboratory Systems*, 50(1):1–18, 2000. ISSN 0169-7439. doi: 10.1016/S0169-7439(99)00047-7.

[7] B.W. Silverman. *Density Estimation for Statistics and Data Analysis*. 02 2018. ISBN 9781315140919. doi: 10.1201/9781315140919.

[8] E. WEISZFELD. Sur le point pour lequel la somme des distances de n points donnés est minimum. *Tohoku Mathematical Journal, First Series*, 43:355–386, 1937.

[9] Hang Zhou, Rachel L. Kember, Joseph D. Deak, Heng Xu, Sylvanus Toikumo, Kai Yuan, Penelope A. Lind, Leila Farajzadeh, Lu Wang, Alexander S. Hatoum, Jessica Johnson, Hyunjoon Lee, Travis T. Mallard, Jiayi Xu, Keira J. A. Johnston, Emma C. Johnson, Trine Tollerup Nielsen, Marco Galimberti, Cecilia Dao, Daniel F. Levey, Cassie Overstreet, Enda M. Byrne, Nathan A. Gillespie, Scott Gordon, Ian B. Hickie, John B. Whitfield, Ke Xu, Hongyu Zhao, Laura M. Huckins, Lea K. Davis, Sandra Sanchez-Roige, Pamela A. F. Madden, Andrew C. Heath, Sarah E. Medland, Nicholas G. Martin, Tian Ge, Jordan W. Smoller, David M. Hougaard, Anders D. Børglum, Ditte Demontis, John H. Krystal, J. Michael Gaziano, Howard J. Edenberg, Arpana Agrawal, Amy C. Justice, Murray B. Stein, Henry R. Kranzler, Joel Gelernter, and Million Veteran Program. Multi-ancestry study of the genetics of problematic alcohol use in over 1 million individuals. *Nature Medicine*, 29(12):3184–3192, 2023. doi: 10.1038/s41591-023-02653-5.

[10] Mark J. Adams, Fabian Streit, Xiangrui Meng, Swapnil Awasthi, Brett N. Adey, Karmel W. Choi, V. Kartik Chundru, Jonathan R.I. Coleman, Bart Ferwerda, Jerome C. Foo, Zachary F. Gerring, Olga Giannakopoulou, Priya Gupta, Alisha S.M. Hall, Arvid Harder, David M. Howard, Christopher Hübel, Alex S.F. Kwong, Daniel F. Levey, Brittany L. Mitchell, Guiyan Ni, Vanessa K. Ota, Oliver Pain, Gita A. Pathak, Eva C. Schulte, Xueyi Shen, Jackson G.

Thorp, Alicia Walker, Shuyang Yao, Jian Zeng, Johan Zvrskovec, Dag Aarsland, Ky'Era V. Actkins, Mazda Adli, Esben Agerbo, Mareike Aichholzer, Allison Aiello, Tracy M. Air, Thomas D. Als, Evelyn Andersson, Till F.M. Andlauer, Volker Arolt, Helga Ask, Julia Bäckman, Sunita Badola, Clive Ballard, Karina Banasik, Nicholas J. Bass, Aartjan T.F. Beekman, Sintia Belangero, Tim B. Bigdeli, Elisabeth B. Binder, Ottar Bjerkeset, Gyda Bjornsdottir, Sigrid Børte, Emma Bränn, Alice Braun, Thorsten Brodersen, Tanja M. Brückl, Søren Brunak, Mie T. Bruun, Margit Burmeister, Pichit Buspavanich, Jonas Bybjerg-Grauholm, Enda M. Byrne, Jianwen Cai, Archie Campbell, Megan L. Campbell, Adrian I. Campos, Enrique Castelao, Jorge Cervilla, Boris Chaumette, Chia-Yen Chen, Hsi-Chung Chen, Zhengming Chen, Sven Cichon, Lucía Colodro-Conde, Anne Corbett, Elizabeth C. Corfield, Baptiste Couvy-Duchesne, Nick Craddock, Udo Dannlowski, Gail Davies, E. J. C. de Geus, Ian J. Deary, Franziska Degenhardt, Abbas Dehghan, J. Raymond DePaulo, Michael Deuschle, Maria Didriksen, Khoa Manh Dinh, Nese Direk, Srdjan Djurovic, Anna R. Docherty, Katharina Domschke, Joseph Dowsett, Ole Kristian Drange, Erin C. Dunn, William Eaton, Gudmundur Einarsson, Thalia C. Eley, Samar S.M. Elsheikh, Jan Engelmann, Michael E. Benros, Christian Erikstrup, Valentina Escott-Price, Chiara Fabbri, Yu Fang, Sarah Finer, Josef Frank, Robert C. Free, Linda Gallo, He Gao, Michael Gill, Maria Gilles, Fernando S. Goes, Scott Douglas Gordon, Jakob Grove, Daniel F. Gudbjartsson, Blanca Gutierrez, Tim Hahn, Lynsey S. Hall, Thomas F. Hansen, Magnus Haraldsson, Catharina A. Hartman, Alexandra Havdahl, Caroline Hayward, Stefanie Heilmann-Heimbach, Stefan Herms, Ian B. Hickie, Henrik Hjalgrim, Jens Hjerling-Leffler, Per Hoffmann, Georg Homuth, Carsten Horn, Jouke-Jan Hottenga, David M. Hougaard, Iiris Hovatta, Qin Qin Huang, Donald Hucks, Floris Huider, Karen A. Hunt, Nicholas S. Ialongo, Marcus Ising, Erkki Isometsä, Rick Jansen, Yunxuan Jiang, Ian Jones, Lisa A. Jones, Lina Jonsson, Masahiro Kanai, Robert Karlsson, Siegfried Kasper, Kenneth S. Kendler, Ronald C. Kessler, Stefan Kloiber, James A. Knowles, Nastassja Koen, Julia Kraft, Henry R. Kranzler, Kristi Krebs, Theodora Kunovac Kallak, Zoltán Kutalik, Elisa Lahtela, Marilyn Lake, Margit Hørup Larsen, Eric J. Lenze, Melissa Lewins, Glyn Lewis, Liming Li, Bochao Danae Lin, Kuang Lin, Penelope A. Lind, Yu-Li Liu, Donald J. MacIntyre, Dean F. MacKinnon, Brion S. Maher, Wolfgang Maier, Victoria S. Marshe, Gabriela A. Martinez-Levy, Koichi Matsuda, Hamdi Mbarek, Peter McGuffin, Sarah E. Medland, Susanne Meinert, Christina Mikkelsen, Susan Mikkelsen, Yuri Milaneschi, Iona Y. Millwood, Esther Molina, Francis M. Mondimore, Preben Bo Mortensen, Benoit H. Mulsant, Joonas Naamanka, Jake M. Najman, Matthias Nauck, Igor Nenadić, Kasper R. Nielsen, Ilja M. Nolt, Merete Nordentoft, Markus M. Nöthen, Mette Nyegaard, Michael C. O'Donovan, Asmundur Oddsson, Adrielle M. Oliveira, Catherine M. Olsen, Hogni Oskarsson, Sisse Rye Ostrowski, Michael J. Owen, Richard Packer, Teemu Palviainen, Pedro M. Pan, Carlos N. Pato, Michele T. Pato, Nancy L. Pedersen, Ole Birger Pedersen, Wouter J. Peyrot, James B. Potash, Martin Preisig, Michael H. Preuss, Jorge A. Quiroz, Miguel E. Renteria, Charles F. Reynolds III, John P. Rice, Saori Sakaue, Marcos L. Santoro, Robert A. Schoevers, Andrew Schork, Thomas G. Schulze, Tabea S. Send, Jianxin Shi, Engilbert Sigurdsson, Kritika Singh, Grant C.B. Sinnamon, Lea Sirignano, Olav B. Smeland, Daniel J. Smith, Tamar Sofer, Erik Sørensen, Sundararajan Srinivasan, Hreinn Stefansson, Kari Stefansson, Peter Straub, Mei-Hsin Su, André Tadic, Henning Teismann, Alexander Teumer, Anita Thapar, Pippa A. Thomson, Lise Wegner Thørner, Apostolia Topaloudi, Shih-Jen Tsai, Ioanna Tzoulaki, George Uhl, André G. Uitterlinden, Henrik Ullum, Daniel Umbricht, Robert J. Ursano, Sandra Van der Auwera, Albert M. van Hemert, Abirami Veluchamy, Alexander Viktorin, Henry Völzke, G. Bragi Walters, Xiaotong Wang,

Agaz Wani, Myrna M. Weissman, Jürgen Wellmann, David C. Whiteman, Derek Wildman, Gonneke Willemsen, Alexander T. Williams, Bendik S. Winsvold, Stephanie H. Witt, Ying Xiong, Lea Zillich, John-Anker Zwart, Twenty-Three, Me Research Team, China Kadoorie Biobank Collaborative Group, Estonian Biobank Research Team, Genes & Health Research Team, HUNT All-In Psychiatry, The BioBank Japan Project, VA Million Veteran Program, Ole A. Andreassen, Bernhard T. Baune, Klaus Berger, Dorret I. Boomsma, Anders D. Børglum, Gerome Breen, Na Cai, Hilary Coon, William E. Copeland, Byron Creese, Carlos S. Cruz-Fuentes, Darina Czamara, Lea K. Davis, Eske M. Derks, Enrico Domenici, Paul Elliott, Andreas J. Forstner, Micha Gawlik, Joel Gelernter, Hans J. Grabe, Steven P. Hamilton, Kristian Hveem, Catherine John, Jaakko Kaprio, Tilo Kircher, Marie-Odile Krebs, Po-Hsiu Kuo, Mikael Landén, Kelli Lehto, Douglas F. Levinson, Qingqin S. Li, Klaus Lieb, Ruth J.F. Loos, Yi Lu, Susanne Lucae, Jurjen J. Luykx, Hermine H.M. Maes, Patrik K. Magnusson, Hilary C. Martin, Nicholas G. Martin, Andrew McQuillin, Christel M. Middeldorp, Lili Milani, Ole Mors, Daniel J. Müller, Bertram Müller-Myhsok, Yukinori Okada, Albertine J. Oldehinkel, Sara A. Paciga, Colin N.A. Palmer, Peristera Paschou, Brenda W.J.H. Penninx, Roy H. Perlis, Roseann E. Peterson, Giorgio Pistis, Renato Polimanti, David J. Porteous, Danielle Posthuma, Jill A. Rabinowitz, Ted Reichborn-Kjennerud, Andreas Reif, Frances Rice, Roland Ricken, Marcella Rietschel, Margarita Rivera, Christian Rück, Giovanni A. Salum, Catherine Schaefer, Srijan Sen, Alessandro Serretti, Alkistis Skalkidou, Jordan W. Smoller, Dan J. Stein, Frederike Stein, Murray B. Stein, Patrick F. Sullivan, Martin Tesli, Thorgeir E. Thorgeirsson, Henning Tiemeier, Nicholas J. Timpson, Monica Uddin, Rudolf Uher, David A. van Heel, Karin J.H. Verweij, Robin G. Walters, Sylvia Wassertheil-Smoller, Jens R. Wendland, Thomas Werge, Aeilko H. Zwinderman, Karoline Kuchenbaecker, Naomi R. Wray, Stephan Ripke, Cathryn M. Lewis, and Andrew M. McIntosh. Trans-ancestry genome-wide study of depression identifies 697 associations implicating cell types and pharmacotherapies. *Cell*, 188(3):640–652.e9, 2025. doi: 10.1016/j.cell.2024.12.002.

[11] Mitja I. Kurki, Juha Karjalainen, Priit Palta, Timo P. Sipilä, Kati Kristiansson, Kati M. Donner, Mary P. Reeve, Hannele Laivuori, Mervi Aavikko, Mari A. Kaunisto, Anu Loukola, Elisa Lahtela, Hannele Mattsson, Päivi Laiho, Pietro Della Briotta Parolo, Arto A. Lehisto, Masahiro Kanai, Nina Mars, Joel Rämö, Tuomo Kiiskinen, Henrike O. Heyne, Kumar Veerapen, Sina Rüeger, Susanna Lemmelä, Wei Zhou, Sanni Ruotsalainen, Kalle Pärn, Tero Hiekkalinna, Sami Koskelainen, Teemu Paajanen, Vincent Llorens, Javier Gracia-Tabuenca, Harri Siirtola, Kadri Reis, Abdelrahman G. Elnahas, Benjamin Sun, Christopher N. Foley, Katriina Aalto-Setälä, Kaur Alasoo, Mikko Arvas, Kirsi Auro, Shameek Biswas, Argyro Bizaki-Vallaskangas, Olli Carpen, Chia-Yen Chen, Oluwaseun A. Dada, Zhihao Ding, Margaret G. Ehm, Kari Eklund, Martti Färkkilä, Hilary Finucane, Andrea Ganna, Awaisa Ghazal, Robert R. Graham, Eric M. Green, Antti Hakanen, Marco Hautalahti, Åsa K. Hedman, Mikko Hiltunen, Reetta Hinttala, Iiris Hovatta, Xinli Hu, Adriana Huertas-Vazquez, Laura Huilaja, Julie Hunkapiller, Howard Jacob, Jan-Nygaard Jensen, Heikki Joensuu, Sally John, Valtteri Julkunen, Marc Jung, Juhani Junttila, Kai Kaarniranta, Mika Kähönen, Risto Kajanne, Lila Kallio, Reetta Kälviäinen, Jaakko Kaprio, Nurlan Kerimov, Johannes Kettunen, Elina Kilpeläinen, Terhi Kilpi, Katherine Klinger, Veli-Matti Kosma, Teijo Kuopio, Venla Kurra, Triin Laisk, Jari Laukkanen, Nathan Lawless, Aoxing Liu, Simonne Longerich, Reedik Mägi, Johanna Mäkelä, Antti Mäkitie, Anders Malarstig, Arto Mannermaa, Joseph Maranville, Athena Matakidou, Tuomo Meretoja, Sahar V. Mozaffari, Mari E. K. Niemi, Marianna Niemi, Teemu Niiranen, Christopher J. O´Donnell, Ma´en Obeidat, George Okafo, Hanna M. Ollila, Antti Palomäki,

Tuula Palotie, Jukka Partanen, Dirk S. Paul, Margit Pelkonen, Rion K. Pendergrass, Slavé Petrovski, Anne Pitkäranta, Adam Platt, David Pulford, Eero Punkka, Pirkko Pussinen, Neha Raghavan, Fedik Rahimov, Deepak Rajpal, Nicole A. Renaud, Bridget Riley-Gillis, Rodosthenis Rodosthenous, Elmo Saarentaus, Aino Salminen, Eveliina Salminen, Veikko Salomaa, Johanna Schleutker, Raisa Serpi, Huei-yi Shen, Richard Siegel, Kaisa Silander, Sanna Siltanen, Sirpa Soini, Hilkka Soininen, Jae Hoon Sul, Ioanna Tachmazidou, Kaisa Tasanen, Pentti Tienari, Sanna Toppila-Salmi, Taru Tukiainen, Tiinamaija Tuomi, Joni A. Turunen, Jacob C. Ulirsch, Felix Vaura, Petri Virolainen, Jeffrey Waring, Dawn Waterworth, Robert Yang, Mari Nelis, Anu Reigo, Andres Metspalu, Lili Milani, Tõnu Esko, Caroline Fox, Aki S. Havulinna, Markus Perola, Samuli Ripatti, Anu Jalanko, Tarja Laitinen, Tomi P. Mäkelä, Robert Plenge, Mark McCarthy, Heiko Runz, Mark J. Daly, Aarno Palotie, and FinnGen. FinnGen provides genetic insights from a well-phenotyped isolated population. *Nature*, 613(7944):508–518, 2023. doi: 10.1038/s41586-022-05473-8.

[12] John D. Storey. A direct approach to false discovery rates. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 64(3):479–498, 2002. doi: 10.1111/1467-9868.00346.